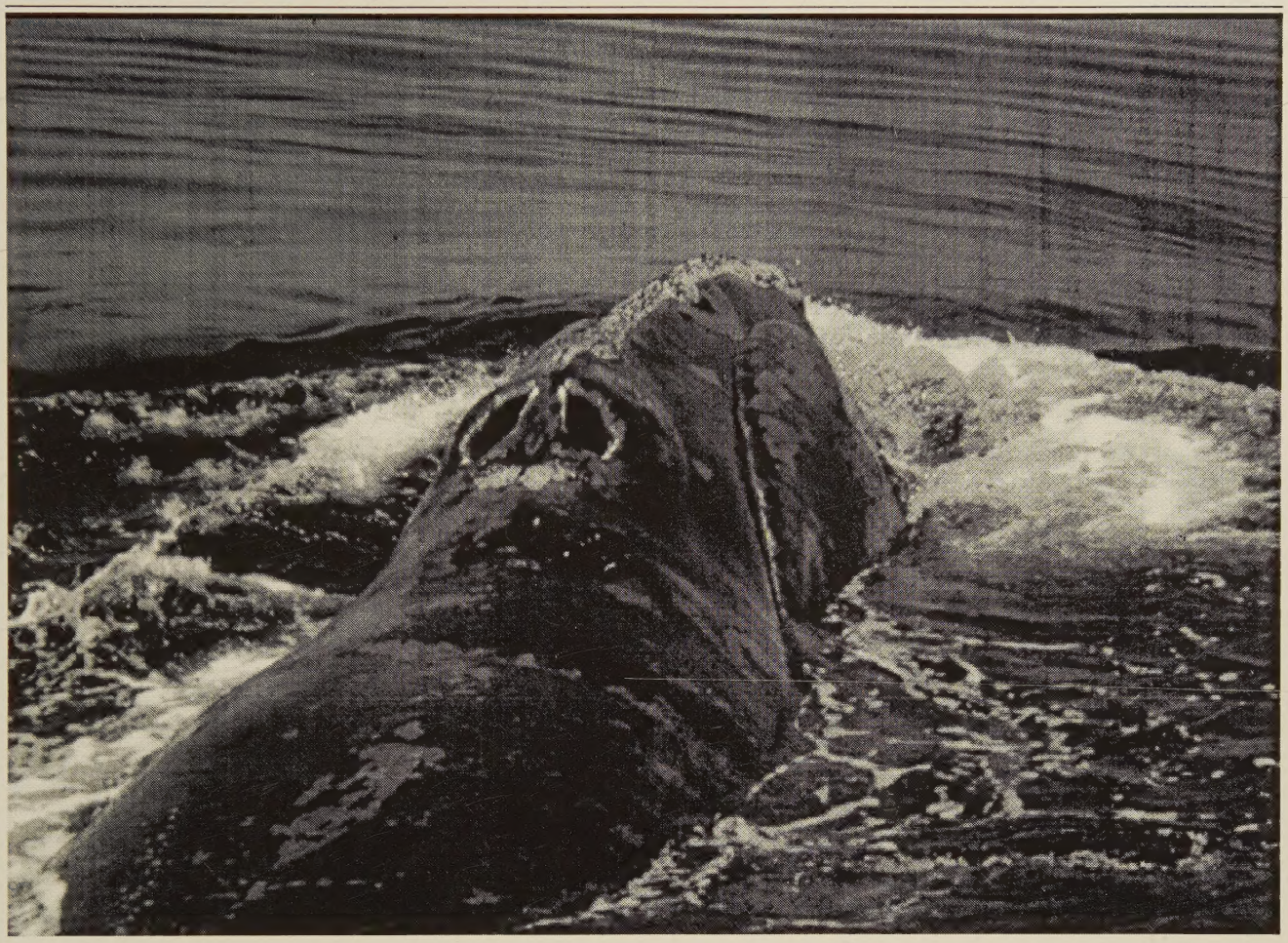
Marine Mammal Protection Act of 1972
Annual Report

January 1, 1997 to December 31, 1997



Prepared by
U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Protected Resources

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1335 East-West Highway
Silver Spring, MD 20910
THE DIRECTOR

OCT 13 1998

The Honorable John McCain
Chairman, Committee on Commerce,
Science, and Transportation
United States Senate
Washington, D.C. 20510

The Honorable Don Young
Chairman, Committee on Resources
House of Representatives
Washington, D.C. 20515

Dear Chairman McCain and Chairman Young:

I am pleased to submit to you the National Marine Fisheries Service (NMFS) Annual Report regarding the administration of the Marine Mammal Protection Act (MMPA) from January 1, 1997 to December 31, 1997, as required by section 103 (f) of the MMPA. The report addresses the conservation, management, and research activities conducted by NMFS for the benefit of marine mammals, including whales, dolphins, and porpoise of the order Cetacea and seals and sea lions of the suborder Pinnipedia.

Sincerely,

Rolland A. Schmitten

Enclosure

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

Marine Mammal Protection Act of 1972
Annual Report
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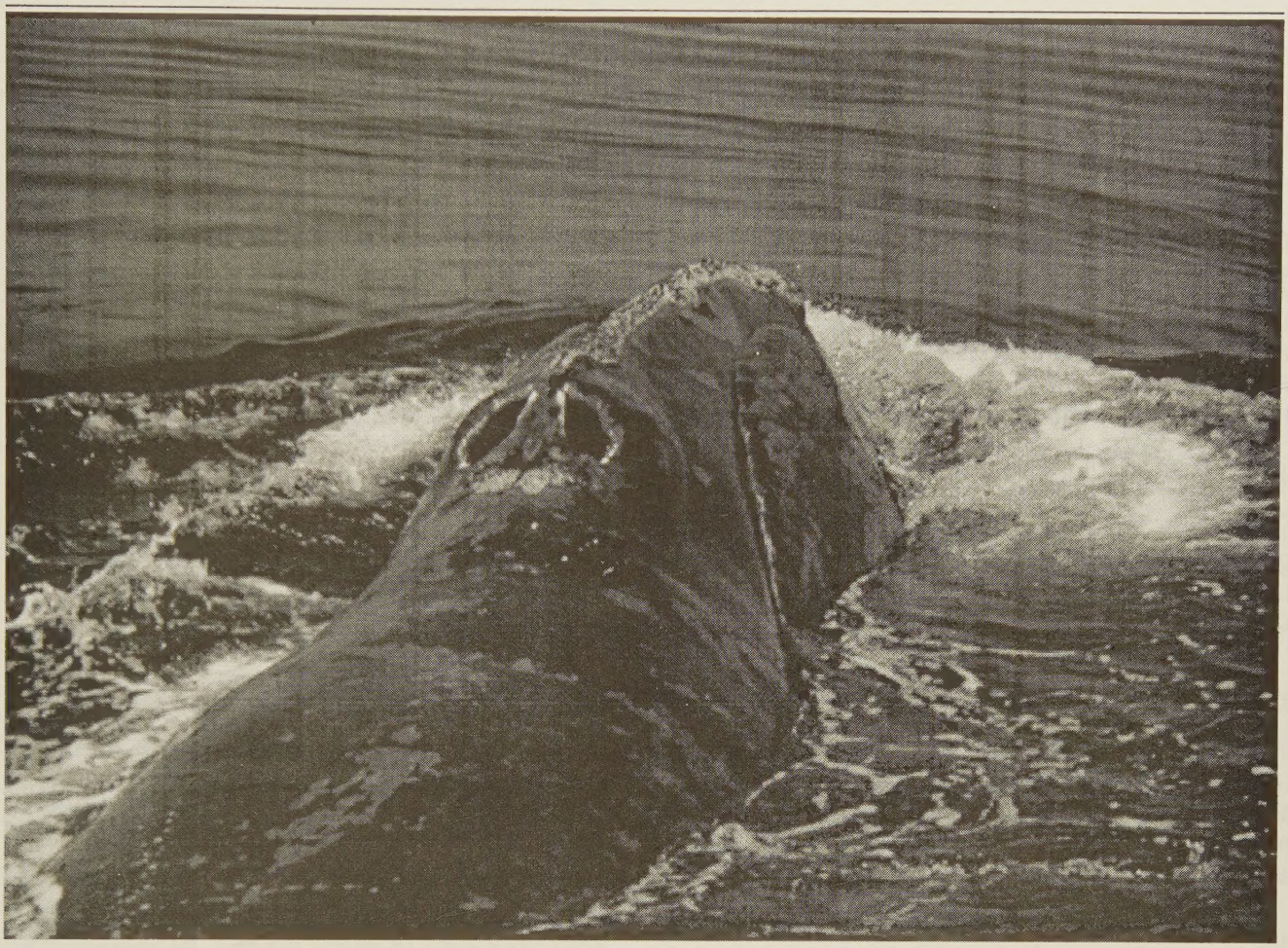

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Editor: Nicole R. Le Boeuf

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of stock assessment reports for all marine mammal stocks in U.S. waters, and the development and implementation of take reduction teams and their plans to reduce bycatch of selected "strategic" marine mammal stocks as defined in the MMPA.

The effects that the MMPA has had on the status of marine mammals around the world is certainly immeasurable. Numerous countries not only look toward the United States for guidance on marine mammal conservation issues, but have also established policies of their own patterned after the MMPA. Here in the United States, we have only begun to quantify the MMPA's impact on marine mammal stocks. However, some tangible results can been recognized. Some species of marine mammals have recovered so well as to be removed from the List of Endangered and Threatened Widllife such as the eastern North Pacific stock of gray whale, which has the distinction of being the first marine mammal species to be removed from this list.

Although the passage of the MMPA has been beneficial by assisting the recovery of some species, this protection has also resulted in the escalation of other marine mammal/human conflicts. For example, on the West Coast of the United States, some pinniped populations are thriving. Their numbers and the continually increasing use of coastal resources by people have exacerabated interactions between these two worlds. These complicated situations can cause shifts in protective needs of the species and create difficult management decisions that must be evaluated by the overarching principles of ecosystem management.

On the opposite end of the spectrum, there are some species on which scientists have spent much time and many resources attempting to recovery from decline and, despite considerable and often exhaustive, focused conservation efforts, these species remain critically endangered. Among these are the Hawaiian monk seal and northern right whale, for which recovery efforts have included the study of life histories and the reduction of human-caused injury and mortality, among numerous other conservation and management actions. Still, the future of these species is uncertain.

Perplexing and nonetheless frustrating is the lack of success and difficult in recovering listed species and stocks where the primary threats to the population are not understood. The western stock of Steller sea lions in Alaska have dramatically diminished in numbers since the 1970s and continue to do so. Although they have been the focus of intensive research, no clear cut answer as to why their populations are declining has been ascertained, making establishment of recovery actions arduous.

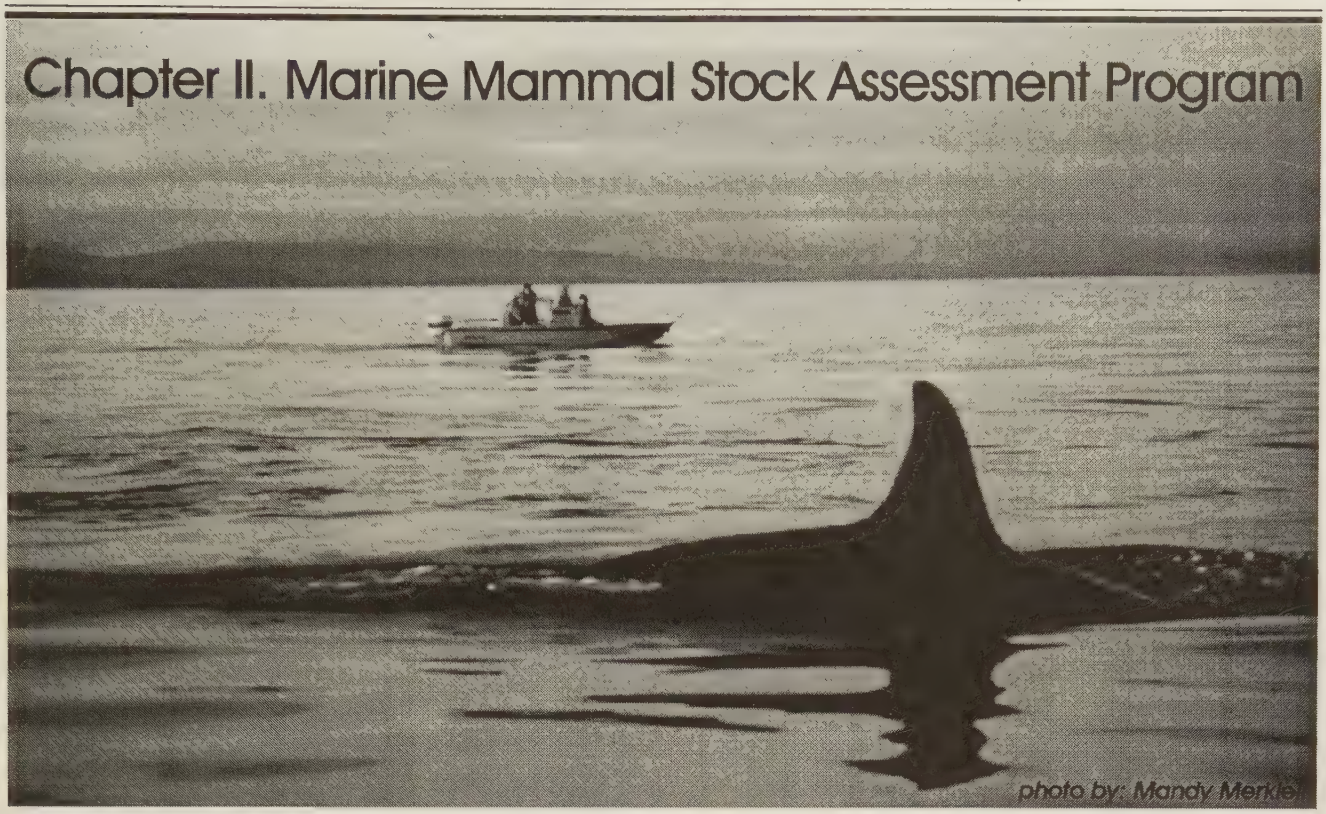
This report addresses in more detail many of these issues, primarily focusing on research and management activities conducted by NMFS in 1997 relative to the MMPA Amendments of 1994 and their significance to the dual goals of the MMPA, resource management and marine mammal protection. From section 3(2) of the MMPA, the scope of these programs may,

"...constitute a modern scientific resource program, including, but not limited to, research, census, law enforcement, and habitat acquistion and improvement."

This report also reviews permits issued in 1997 for purposes pursuant to the MMPA.

Copies of the MMPA 1997 Annual Report as well as other publications compiled in association with NMFS management and conservation activities are available from the Office of Protected Resources in Silver Spring, Maryland. See Appendix G for this address as well as those of the NMFS Regional Offices and Fisheries Science Centers.

Chapter II. Marine Mammal Stock Assessment Program



Section 117 of the Marine Mammal Protection Act (MMPA) requires the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (FWS) to prepare and periodically update marine mammal stock assessment reports.

Section 117 (a)(1) states that NMFS shall:

"... prepare a draft stock assessment for each marine mammal stock which occurs in waters under the jurisdiction of the United States. Each draft stock assessment, based on the best scientific information available, shall —

1) describe the geographic range of the affected stock, including any seasonal or temporal variation in such range;

2) provide for such stock the minimum population estimate, current and maximum net productivity rates, and current population trend, including a description of the information upon which these are based;

3) estimate the annual human-caused mortality and serious injury of the stock by source and, for a strategic stock, other factors that may be causing a decline or impeding recovery of the stock, including effects on marine mammal habitat and prey;

4) describe commercial fisheries that interact with the stock, including —

a) the approximate number of vessels actively participating in each such fishery;

b) the estimated level of incidental mortality and serious injury of the stock by such fishery on an annual basis;

c) seasonal or areal differences in such incidental mortality and serious injury;

d) the rate, based on the appropriate standard unit of fishing effort, of such incidental mortality and serious injury, and an analysis stating whether such level is insignificant and is approaching a zero mortality and serious injury rate;

5) categorize the status of the stock as one that either —

a) has a level of human-caused mortality and seri-

ous injury that is not likely to cause the stock to be reduced below its optimum sustainable population; or

b) is a strategic stock, with a description of the reasons therefore; and

6) estimate the potential biological removal level for the stock, describing the information used to calculate it, including the recovery factor."

NMFS convened a workshop in 1994 to develop guidelines for preparing the stock assessment reports. These guidelines were finalized in 1995, and the 1995 stock assessment reports were based on these guidelines.

In April 1996, NMFS convened a workshop to evaluate the guidelines upon which stock assessment reports were based and to revise the guidelines as needed. The workshop results indicated that substantive changes to the guidelines were not required; however, several provisions were clarified, primarily to ensure that default values for various parameters were interpreted correctly. A report of this workshop, along with final revised guidelines for preparing the stock assessment reports, was published in February 1997.

Marine Mammal Stock Assessment Reports

The MMPA requires NMFS and FWS to review the stock assessment reports annually for strategic stocks of marine mammals and every three years for stocks determined to be non-strategic consistent with any new information. NMFS has revised those reports for which significant new information is available (See Appendix A. Summary of Marine Mammal Stock Assessments for Stocks Under NMFS Authority). These 1996 Stock Assessment Reports were published in the fall of 1997 in three separate documents, with notification of the publication being published in the *Federal Register* in January of 1998.

The 1996 Stock Assessment Reports

Alaska: Hill, P.S., D. P. DeMaster, and R.J. Small. 1997. Alaska Marine Mammal Stock Assessments, 1996. NOAA Technical Memorandum NMFS-AFSC-78, 150 pp.

Atlantic: Waring, G.T., D. L. Palka, K.D. Mullin, J.H.W. Hain, L.J. Hansen, and K.D. Bisack. 1997. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments , 1996. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NE-114, 250 pp.

Pacific: Barlow, J., K. Forney, P.S. Hill, R.L. Brownell, Jr., J.V. Carretta, D.P. DeMaster, F. Julian, M. S. Lowry, T. Ragen, and R. Reeves. 1997. U.S. Pacific Marine Mammal Stock Assessments: 1996. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-248, 162 pp.

The 1996 Marine Mammal Stock Assessment Reports

Most changes to the stock assessment reports incorporated new information from abundance or mortality estimates. Although stock structure was reexamined, andresulted in revised stock identification for killer whales in the Alaska and Pacific regions and for harbor porpoise in Alaska, none of these stocks was designated as strategic.

A total of 145 stocks were defined for taxa that are under the authority of NMFS (see Appendix A), which are cetaceans and most pinnipeds (eight additional stocks of manatees, polar bears, sea otters, and walrus are under the authority of the FWS). There were 57 marine mammal stocks defined in the Atlantic and Gulf of Mexico, 55 defined along the Pacific coast of the continental U.S. and Hawaii, and 33 defined in Alaska or the North Pacific. Further work on the definition of stock structure of many species is needed, including: Pacific and Atlantic harbor porpoise, Pacific killer whales, beluga whales, Atlantic bottlenose dolphins, and Pacific harbor seals. NMFS therefore anticipates that the number of stocks will change as additional information is collected and stock structure is revised.

Stocks Designated Strategic with Human-Caused Mortality Greater than PBR

Sixteen stocks that have an estimated human-caused mortality greater than the calculated Potential Biological Removal level (PBR) are designated strategic (see Figure 1, page 6). Along the Atlantic coast of the continental United States, there were nine strategic stocks of cetaceans out of a total of 31 stocks. Minimum estimated right whale mortality from collisions with ships (1.4) and from entanglement in fishing gear (1.1) were both alone estimated to be greater than PBR (0.4). Mortality in the Atlantic large pelagics drift gillnet fishery for swordfish, tuna, and shark was primarily responsible for the strategic designation in six of the nine stocks. Significant mortality of some of these stocks also occurred in the Atlantic pair-trawl fishery and the Atlantic longline fishery, both of which also target swordfish, tuna, and shark. It is possible that there was also significant mortality of some stocks in the Atlantic squid, mackerel, butterfish trawl fishery, although available data have not yet been analyzed. The Gulf of Maine harbor porpoise had fisheries mortality estimated to be 3.8 times its PBR, primarily in the New England multispecies sink gillnet fishery. The mid-Atlantic coastal gillnet fishery was thought to be responsible for incidental mortality estimated from strandings that exceeds the PBR of Atlantic coastal bottlenose dolphins, as well as being responsible for additional mortality of harbor porpoise.

Along the Pacific coast of the continental United States, five stocks out of a total of 35 were considered strategic because incidental fishery mortality exceeded their calculated PBRs. Their incidental mortality is nearly exclusively from the California/Oregon thresher shark/swordfish drift gillnet fishery.

None of the 26 stocks in the Gulf of Mexico had estimates of incidental fishery mortality greater than their PBR. Similarly, none of the 20 Hawaii stocks had fisheries mortality greater than PBR.

None of the 33 Alaska stocks had incidental fishery mortality that exceeded their calculated PBR; however, only one of 13 Category II fisheries in Alaska have been observed to estimate their marine mammal mortality levels. The stocks of Cook Inlet beluga whales *(Delphinapterus leucas)* and western Steller sea lions *(Eumetopias jubatus)* had estimated human-caused mortality that was greater than PBR. For both stocks the primary source of mortality was subsistence harvest.

Changes From the 1995 Assessments

Three Alaska stocks were identified as special subsistence stocks in the initial 1995 stock assessment reports, including beluga whales in Cook Inlet and Norton Sound and harbor seals in the Gulf of Alaska. After examining new information, and in accordance with advice from the Alaska Scientific Review Group, NMFS revised these reports to present the full information required under the MMPA. The Norton Sound beluga whale (re-named the eastern Bering Sea stock of beluga) was identified as non-strategic because its estimated human-caused mortality was less than PBR in the revised assessment. As noted above, the stock of Cook Inlet beluga whales was designated strategic because subsistence harvest was estimated to be greater than the PBR. The estimated human-caused mortality of Gulf of Alaska harbor seals *(Phoca vitulina)* was also greater than their calculated PBR. The stock assessment report for this stock states,

"...because of 1) uncertainty regarding stock boundaries, 2) the likelihood that the cooperative management process will address the concern that this stock may be over harvested, and 3) the likelihood that the current level of take is sustainable because the total removal of female harbor seals is less than one-half of PBR, this stock is not classified as strategic at this time."

Estimated human-caused mortality was greater than PBR for the western stock of Steller sea lion for the first time in 1996. This was due to the PBR being lowered when the stock was listed as endangered under the Endangered Species Act (ESA). Any management actions concerning these or any other stock that is used for subsistence purposes would be addressed through a co-management process as indicated by section 119 of the MMPA (see Chapter VIII. Native Take of Marine Mammals).

New abundance estimates were made for the following three stocks of deep-diving whales: Baird's beaked whale

Figure 1. 1996 marine mammal stock assessment reports: stocks with estimated annual human-caused mortality greater than PBR and designated as strategic.

Species	Stock Area	PBR	Total Annual Mortality	Annual Fisheries Mortality	Primary Source of Mortality
North Atlantic right whale	W. North Atlantic	0.4	2.5	1.1	Collisions with ships
Harbor porpoise	Gulf of Maine/Bay of Fundy	483	1,834	1,834	Northeast multispecies sink gillnet fishery
Common dolphin	W. North Atlantic	40	234	234	Atlantic large pelagics drift gillnet fishery
Atlantic spotted dolphin	W. North Atlantic	16	22	22	Atlantic large pelagics drift gillnet fishery
Pantropical spotted dolphin	W. North Atlantic	16	22	22	Atlantic large pelagics drift gillnet fishery
Cuvier's beaked whale	W. North Atlantic	8.9	9.7	9.7	Atlantic large pelagics drift gillnet fishery
Mesoplodont beaked whale	W. North Atlantic	8.9	9.7	9.7	Atlantic large pelagics drift gillnet fishery
Pilot whale, short-finned	W. North Atlantic	3.7	42	42	Atlantic large pelagics drift gillnet fishery
Bottlenose dolphin	W. North Atlantic, coastal	25	29	29	Undetermined fisheries interactions, suspected of being from mid-Atlantic coastal gillnet fishery
Pilot whale, short-finned	CA/ OR/WA	5.9	13	13	CA/OR thresher shark/swordfish drift gillnet fishery
Mesoplodont beaked whale	CA/OR/ WA	11	9.2-13	9.2-13	CA/OR thresher shark/swordfish drift gillnet fishery
Sperm whale	CA to WA	1.8	4.5	4.5	CA/OR thresher shark/swordfish drift gillnet fishery
Humpback whale	California/ Mexico	0.5	1.8	1.2	CA/OR thresher shark/swordfish drift gillnet fishery
Minke whale	CA/ OR/ WA	1.0	1.2	1.2	CA/OR thresher shark/swordfish drift gillnet fishery
Steller sea lion	Western U.S.	383	447	35	Subsistence harvest
Beluga	Cook Inlet	15	40	0	Subsistence harvest

(Berardius bairdii), Cuvier's beaked whale *(Ziphius cavirostris)*, and pygmy sperm whale *(Kogia breviceps)* in the Pacific Ocean. These estimates were higher because they included a recently developed correction factor for animals not detected on the track line. This allowed NMFS to determine that human-caused mortality and serious injury of these stocks did not exceed PBR; therefore, these stocks were changed from strategic to non-strategic (see Figure 2, page 7). However, a lower abundance estimate and a higher mortality estimate led to the designation of the California/Oregon/Washington stock of minke whale *(Balaenoptera acutorostrata)* as strategic.

The following four stocks in the Atlantic were reported as having mortality levels that exceeding their PBRs in the 1995 assessments, but that decreased to below PRB in 1996: sperm whale *(Physeter macrocephalus)*, long-finned pilot whale *(Globicephala melas)*, Atlantic white-sided dolphin *(Lagenorhynchus acutus)*, and offshore bottlenose dolphin *(Tursiops truncatus)* (see Figure 2, page 7). A combination of higher abundance estimates (for three of the stocks) and lower mortality estimates (also for three of the stocks) led to their estimated human-caused mortality being lower than PBR. The higher abundance estimates resulted from a new survey in 1995 that covered a larger area. The mortality estimates changed because a different time period was used, in the interest of using the most current information. The 1996 reports used the years 1991-95, while the 1995 stock assessment reports used the years 1989-93. Because there was no recognized causal mechanism, such as a reduction in fishing effort or mitigation measures to explain the lower mortality, the changes in estimated mortality may be due to sampling variability.

Stocks Listed as Endangered, Threatened, or Depleted

Stocks that are listed as endangered or threatened under the ESA or are designated as depleted under the MMPA are automatically designated as strategic. There are 27 stocks in this category (see Figure 3, page 8). The blue *(Balaenoptera musculus)*, fin *(Balaenoptera physalus)*, sei *(Balaenoptera borealis)*, humpback *(Megaptera novaeangliae)*, right *(Eubalaena glacialis)*, bowhead (*Balaena mysticetus)*, and sperm whales were all listed as endangered in the 1970s, primarily because they were considered severely depleted due to harvest by commercial whalers. The Hawaiian monk seal *(Monachus schauinslandi)* is listed as endangered for a variety of reasons, including concern about their low and declining population size. The guadalupe fur seal *(Arctocephalus townsendi)* are listed as threatened because of their reduction to a very low population size from direct harvest.

Figure 2. Marine mammal stocks that had mortality levels above PBRin the 1995 assessments, but decreased to below PBR in the 1996 assessments.

Species	Stock Area	PBR	Total Annual Mortality	Annual Fish. Mortality
Atl. white-sided dolphin	Western North Atlantic	192	181	181
Bottlenose dolphin	Western North Atlantic, offshore	88	82	82
Pilot whale, long-finned	Western North Atlantic	50	42	42
Sperm whale	Western North Atlantic	3.2	0.2	0.2
Baird's beaked whale	California/Oregon/ Washington	2.0	1.2	1.2
Cuvier's beaked whale	California/ Oregon/ Washington	61	28	28
Pygmy sperm whale	California/ Oregon/ Washington	19	2.8	2.8

Steller sea lions were listed as threatened because of recent declines, and the western stock's status was recently changed to endangered because of its continuing decline, whereas the eastern stock remained threatened. Northern fur seals were designated as depleted because of a population decline from the mid-1970s to the mid-1980s. Coastal bottlenose dolphins were also designated depleted after an anomalous mortality event in 1988-89.

Other Stocks Designated Strategic

Six other stocks were designated strategic because of potential fishery interaction problems, a lack of information, or because of other potential problems with human-caused mortality. These stocks are the Atlantic dwarf sperm whale *(Kogia simus)*, Atlantic pygmy sperm whale *(Kogia breviceps)*, Gulf of Mexico Bays, Sounds, and Estuaries bottlenose dolphin *(Tursiops truncatus)*, Gulf of Mexico dwarf sperm whale *(Kogia simus)*, Gulf of Mexico pygmy sperm whale, and the Gulf of Mexico short-finned pilot whale *(Globicephala macrorhynchus)*.

The Scientific Review Groups

The regional scientific review groups (SRGs) were established as directed by section 117 (d) which states that:

"(I) Not later than 60 days after the date of enactment of this section [June 29, 1994], the Secretary of Commerce shall, in consultation with the Secretary of the Interior (with respect to marine mammals under that Secretary's jurisdiction), the Marine Mammal Commission, the Governors of affected adjacent coastal States, regional fishery and wildlife management authorities, Alaska Native organizations and Indian tribes, and environmental and fishery groups, establish three independent regional scientific review groups representing Alaska, the Pacific Coast (including Hawaii), and the Atlantic Coast (including the Gulf of Mexico), consisting of individuals with expertise in marine mammal biology and ecology, population dynamics and modeling, commercial fishing technology and practices, and stocks taken under section 101(b). The Secretary of Commerce shall, to the maximum extent practicable, attempt to achieve a balanced representation of viewpoints among the individuals on each regional scientific review group. The regional scientific review groups shall advise the Secretary on—

(A) population estimates and the population status and trends of such stocks;

(B) uncertainties and research needed regarding stock separation, abundance, or trends, and factors affecting the distribution, size, or productivity of the stock;

Scientific Review Group meetings held in 1997

Atlantic SRG
New Orleans, LA - May 22-23, 1997
Charleston, SC - November 4-7, 1997

Alaska SRG
Seattle, WA - May7-9, 1997
Seattle, WA - October 21-23, 1997

Pacific SRG
Seattle, WA - May 6-8, 1997
La Jolla, CA - October 15-17, 1997

(C) uncertainties and research needed regarding the species, number, ages, gender, and reproductive status of marine mammal;

(D) research needed to identify modifications in fishing gear and practices likely to reduce incidental mortality and serious injury of marine mammals in commercial fishing operations;

(E) the actual, expected, or potential impacts of habitat destruction, including marine pollution and natural environmental change, on specific marine mammal species or stocks, and for strategic stocks, appropriate conservation or management measures to alleviate any such impacts; and

(F) any other issue which the Secretary or the groups consider appropriate.

(II) The scientific review groups established under this subsection shall not be subject to the Federal Advisory Committee Act (5 app. U.S.C.).

(III) Members of the scientific review groups shall serve without compensation, but may be reimbursed by the Secretary, upon request, for reasonable travel costs and expenses incurred in performing their obligations.

(IV) The Secretary may appoint or reappoint individuals to the regional scientific review groups under paragraph (1) as needed."

The three SRGs were formed in 1994 with approximately 11 members each (see Figure 4, page 10). These groups are convened and organized out of each of the following NMFS Fisheries Science Centers: Alaska, Southwest and Northeast/Southeast.

Each SRG has a designated NMFS contact person at these Centers. The Centers are responsible for assisting the SRG members in arranging meetings, identifying and coordinating lodgings and travel accommodations, pro-

Figure 3. Summary of NMFS stocks that are strategic because they are listed under the ESA or MMPA. Some of these stocks have human-caused mortality greater than the calculated PBR.

Species	Stock	Listing status
North Atlantic right whale	W. North Atlantic	Endangered
Humpback whale	W. North Atlantic	Endangered
Fin whale	W. North Atlantic	Endangered
Sei whale	W. North Atlantic	Endangered
Blue whale	W. North Atlantic	Endangered
Sperm whale	W. North Atlantic	Endangered
Bottlenose dolphin	W. North Atlantic, coastal	Depleted
Sperm whale	N. Gulf of Mexico	Endangered
Sperm whale	CA/OR/WA	Endangered
Humpback whale	CA/OR/WA-Mexico	Endangered
Blue whale	California/Mexico	Endangered
Fin whale	California/Oregon/Washington	Endangered
Sei whale	Eastern North Pacific	Endangered
Guadalupe fur seal	Mexico/California	Threatened
Blue whale	Hawaii	Endangered
Fin whale	Hawaii	Endangered
Sperm whale	Hawaii	Endangered
Hawaiian monk seal	Hawaii	Endangered
Steller sea lion	Western, U.S.	Endangered
Steller sea lion	Eastern, U.S.	Threatened
Northern fur seal	North Pacific	Depleted
Sperm whale	Alaska	Endangered
Humpback whale	Western North Pacific	Endangered
Humpback whale	Central North Pacific	Endangered
Fin whale	Alaska	Endangered
Northern right whale	North Pacific	Endangered
Bowhead whale	Western Arctic Stock	Endangered

viding materials requiring SRG consultation, and assisting in facilitating communication between SRG members and documentation of recommendations. NMFS, through the Centers, provides travel, hotel and meeting-location expenses.

In their first year of existence, the SRGs reviewed the proposed guidelines for stock assessment reports. Additionally, they reviewed the draft 1995 stock assessment reports themselves and assisted NMFS in revising and finishing the 1995 assessments. In 1996, the SRGs reviewed draft 1996 stock assessment reports, which were updates of the 1995 reports. The SRGs also sent representatives to a workshop that revised the guidelines for preparing the stock assessment reports, and all of the SRG members were given the opportunity to comment on the revised guidelines.

A total of six SRG meetings were held during 1997 (see page 7). In these meetings, the SRGs reviewed new marine mammal stock data and information and provided NMFS with recommendations for future research. The SRGs reviewed the revised 1996 stock assessment reports and assisted NMFS in bringing these reports to a finished form. Additionally, the guidelines for preparing the stock assessment reports, which the SRGs had reviewed, were published in February 1997, along with the report of the workshop.

The following sections of text have been extracted from the written summaries of the scientific review group meetings that took place in 1997. Where appropriate, recommendations relevant to marine mammal species (sea otter, walrus, polar bear, and manatee) under the jurisdiction of the U.S. Fish and Wildlife Service have been removed.

ATLANTIC SCIENTIFIC REVIEW GROUP
5th Meeting, 22-23 May 1997
New Orleans, LA

Recommendations

The Atlantic SRG reviewed research priorities for the upcoming FY98 MMPA Funding Review Panel. The Atlantic SRG prioritized research needs in the following areas:

Stock Assessment

1) Estimate stock identification and abundance for coastal bottlenose dolphins, particularly along the Atlantic coast. Stock identification should be resolved through a combination of techniques, including photographic identification, genetics, and telemetry.

2) Improve understanding of the species and stock identity and abundance of pelagic cetaceans, particularly beaked whales, common dolphins, and pilot whales.

3) Improve understanding of the stock structure of harbor porpoises impacted by incidental catches in the Gulf of Maine and mid-Atlantic regions.

4) Improve estimation of g(0), the proportion of animals that are missed during line transect surveys, particularly for deep-diving species.

5) Estimate abundance of bottlenose dolphins and pilot whales in waters of the U.S. Caribbean Sea.

Mortality Estimation

1) Improve estimates of fishing effort for most fisheries in the Atlantic and Gulf of Mexico that interact with marine mammal stocks.

2) Estimate incidental catches of marine mammals for the mixed coastal gillnet fisheries of the Atlantic coast, using strandings and alternative observation techniques, if necessary.

Figure 4. Scientific Review Group members in 1997

Atlantic SRG (NMFS contact: Gordon Waring, Northeast Fisheries Science Center)

Solange Brault	University of Massachusetts, Boston
Joseph DeAlteris	University of Rhode Island
James Gilbert	University of Maine, Orono
Mike Harris	Georgia Department of Natural Resources
Robert D. Kenney	University of Rhode Island
Robert Mackinnon	Marshfield, Massachusetts
James Mead	Smithsonian Institution
Daniel Odell	Sea World, Orlando, Florida
Andrew Read	Duke University Marine Laboratory
Randall S. Wells	Chicago Zoological Society, Mote Marine Laboratory
Graham Worthy	Texas A&M University
Donald Baltz	Louisiana State University

Alaska SRG (NMFS contact: Doug DeMaster, Alaska Fisheries Science Center, Seattle, WA)

Milo Adkison	University of Alaska, Juneau
John Gauvin	Groundfish Forum Inc.
Carl Hild	Rural Alaska Community Action Program
Sue Hills	University of Alaska, Fairbanks
Brendan Kelly	University of Alaska, Juneau
Matt Kookesh	Department of Fish and Game, Alaska
Denby Lloyd	Aleutians East Borough
Lloyd Lowry	Department of Fish and Game, Alaska
Beth Mathews	University of Alaska, Southeast
Craig Matkin	North Gulf Oceanic Society
Caleb Pungowiyi	Kawerak, Nome, Alaska
Jan Straley	Sitka, Alaska
Kate Wynne	Sea Grant Marine Advisory Program, University of Alaska

Pacific SRG (NMFS contact: Jay Barlow, Southwest Fisheries Science Center)

Hannah J. Bernard	Hawaii Wildlife Fund
Robin Brown	Oregon Department of Fish and Wildlife
Mark Fraker	Terramar Environmental Research
Doyle A. Hanan	California Department of Fish and Game
John Heyning	Natural History Museum of Los Angeles County
Chuck Janisse	Federated Independent Seafood Harvesters
Steve Jeffries	Washington Department of Fish and Wildlife
Katherine Ralls	National Zoological Park, Smithsonian Institution
Michael Scott	Inter-American Tropical Tuna Commission
Terry E. Wright	Northwest Indian Fisheries Commission

3) Better characterize incidental catches for the Atlantic trawl fisheries for squid, mackerel, herring, and butterfish.

4) Determine whether current levels and distribution of observer coverage are adequate for mortality estimation in the pelagic longline fishery.

5) Obtain further information on incidental catches of marine mammals in the large mesh shark driftnet fishery in Georgia and Florida.

6) Standardize collection and reporting of information on fisheries interactions from stranded cetaceans and live-entangled pinnipeds and manatees.

7) Increase efforts to detect strandings in areas not currently observed with frequency, such as the shores of Louisiana.

Bycatch Reduction

1) Conduct gear research to reduce entanglements of right and other baleen whales.

2) Evaluate strategies for reducing bycatch of harbor porpoises in sink gill nets, such as the use of acoustic alarms.

3) Conduct research to identify current fishing techniques and practices that have a low probability of marine mammal bycatch.

4) Explore the concept of individual bycatch "quotas" or other means of allocating PBR within and among fisheries.

Recovery and Conservation Plans

1) Update the recovery plan for the Antillean manatee, incorporating information collected since 1986.

2) Estimate abundance and trends of the North Atlantic right whale population using mark-recapture techniques.

3) Conduct demographic analyses of North Atlantic right whales to determine which factors are limiting recovery.

4) Create a recovery plan for mid-Atlantic coastal bottlenose dolphins.

5) Expand survey areas for North Atlantic right whales outside known critical habitat.

6) Conduct forensic analyses of stranded right whales to determine cause(s) of mortality.

Research and Development

1) Encourage the collection and analysis of life history samples from marine mammals caught incidental to commercial fisheries. Whole carcasses should be recovered and necropsied whenever possible.

2) Continue site-specific population monitoring of bottlenose dolphins at long-term research sites, to provide the means for assessing and understanding changes in abundance (these studies also provide useful models for understanding the demography of other, poorly understood delphinid populations).

Expanding Pinniped Populations

1) Conduct surveys of expanding pinniped populations to monitor the growth of these stocks and help anticipate habitat and fisheries-related issues that may develop as a result of this expansion.

2) Encourage the collection and analysis of life history samples from marine mammals caught incidental to commercial fisheries. Whole carcasses should be recovered and necropsied whenever possible.

ATLANTIC SCIENTIFIC REVIEW GROUP
6th Meeting, 5-6 November 1997
Charleston, South Carolina

Recommendations

1) The Atlantic SRG recommends that the NMFS continue to gather information to test the provisional stock designations for bottlenose dolphin *(Tursiops truncatus)* populations in the Gulf of Mexico. The Atlantic SRG notes that there continues to be uncertainty surrounding the biological distinctness and degree of overlap among the 33 provisional stocks.

2) The Atlantic SRG recommends that genetic approaches to stock identification in bottlenose dolphins be combined with more traditional methodologies to define stocks. The Atlantic SRG also recommends that research on stock structure in the Gulf of Mexico should parallel that in the Atlantic.

3) The Atlantic SRG recommends that the next version of the Stock Assessment Report (SAR) for Gulf of Mexico bottlenose dolphins reflect the revised stock structure hypotheses as discussed. The Atlantic SRG also recommends that NMFS reassess the status of the mid-Atlantic bottlenose dolphin stocks after presumed recovery from the 1987 die-off and with changes in current levels of take by commercial fisheries.

4) The Atlantic SRG is concerned that the allocations of MMPA and ESA funds in NMFS do not reflect the needs of Atlantic and Gulf of Mexico marine mammals. The group is also concerned that it is NMFS staff alone that currently participate in these allocation discussions. The group suggests that outside reviewers, especially someone from the U.S. Marine Mammal Commission, participate in the allocation process. The Atlantic SRG would like to preview NMFS Northeast and Southeast Science Center and Regional proposals with the intent of improving the competitiveness of the East Coast proposals.

5) The Atlantic SRG recommends that NMFS consider reclassification of crab fisheries in coastal Atlantic waters because of the number of gear entanglements of bottlenose dolphin and that NMFS continue to monitor the takes in this region.

6) The SRG agrees that it would annually review the SAR for each strategic marine mammal stock and one-third of the non-strategic stocks.

PACIFIC SCIENTIFIC REVIEW GROUP
5th Meeting, 6-8 May 1997
Seattle, Washington

Review of Actions Taken on Previous Pacific SRG Recommendations

The SRG reviewed NMFS activities in response to a list of the previous major recommendations listed in the report of the 3rd meeting of the SRG and reviewed at the 4th meeting.

First Priority

1) The Pacific SRG recommends that a Take Reduction Team (TRT) be formed to evaluate the drift net fishery for shark and swordfish off California. This fishery is involved with all the marine mammal species for which the PBR is exceeded except two (California sea otters and Hawaiian monk seals), which already have recovery teams under the ESA. Because this one fishery is involved with so many stocks, the SRG recommends that one take team for the fishery be established, rather than separate ones for each stock.

A TRT was formed and a mortality reduction plan submitted for public comment.

2) The Pacific SRG recommends conducting a comprehensive survey of the Hawaiian archipelago to fill the large gap in our knowledge about the abundance and status of Hawaiian cetacean stocks. Examining survey data from the Acoustic Thermometry of Ocean Climate (ATOC) experiments may provide additional information for these assessments. Although fishery mortality has not been estimated, available information suggests that instituting observer programs to estimate mortalities would be problematic because of the small-scale na-

ture of the local fisheries. The problem of dolphins that may be shot at to discourage them from stealing fish from fishing lines was thought to be a law enforcement and education issue *rather* than one requiring an observer program.

A funding proposal for a Hawaiian survey was submitted in 1998; however, congressionally mandated surveys of Eastern Tropical Pacific Ocean dolphin stocks in 1998 precluded NMFS from pursuing the Hawaiian research recommendation. A NMFS survey of Hawaiian stocks is planned for 2001.

3) The Pacific SRG recommends that monitoring of the central California harbor porpoise stock continued. Although the almost total closure of the coastal set-net fishery has apparently reduced mortality, recent data suggest that the population still may be declining at a rate of 9-10% per year. Monitoring of this stock should continue to determine if it is truly declining, whether the decline is due to environmental or human-caused factors, and to document the population growth rate in the wake of fishery mortalities and population decline.

Monitoring of the central California harbor porpoise stock continued, and an aerial survey was conducted in 1997.

4) The Pacific SRG recommends that the stock structure of West Coast harbor porpoise be studied in greater detail. This species appears to be particularly vulnerable to interactions with fisheries.

Samples of West Coast harbor porpoise are currently being collected and analyzed by NMFS. Preliminary results were presented by NMFS to the SRG; however, samples from some poorly represented geographic areas are still needed.

5) The Pacific SRG recommends research into developing correction factors to obtain better population estimates for both cetaceans and pinnipeds. For deep-diving cetaceans, such as members of the families Ziphiidae and Kogiidae, research should be conducted to devise correction factors for submerged animals during surveys. For pinnipeds that are counted while hauled out on land, more stock-specific correction factors for estimating the proportion at sea are needed. Demographic models could be developed to estimate the total minimum population size from pup counts.

Field studies have collected significant new data for deep-diving cetaceans and harbor seals. Some correction factors have been incorporated into the current SARs, others will be used in future SARs.

6) The Pacific SRG strongly supports the role of a NMFS liaison to promote consistency among the SRGs. Having a liaison at the Office of Protected Resources has better informed the SRGs, and it is expected that NMFS will continue to fill this need. The group notes the lack of consistency among SRGs for such issues as defining stocks and in the criteria for adopting recovery factors. The group recommends that the NMFS liaison distribute a list of stocks for which non-default values in the PBR calculations have been used, as well as the rationale for those deviations, to provide guidance and promote consistency among the groups in dealing with diverse management situations. The SRG recommends increased communication among the SRGs and within NMFS to maintain consistent application of the PBR concept and increased cooperation with international, state, and other agencies to promote co-management plans.

The Pacific SRG intends to support this exchange of information by encouraging member attendance at other SRG meetings.

7) The Pacific SRG recognizes the problems of increasing pinniped populations in some areas, particularly where pinniped predation on threatened and endangered salmonid species may be an issue. The literature review being conducted by the Pinniped-Fishery Interaction Task Force was not thought to be sufficient for answering the critical fisheries interaction questions for California sea lions and harbor seals along the Northwest Pacific coast, and the SRG recommends region-wide research be conducted, particularly into the food habits of these species.

A report of the working group that NMFS convened to investigate this issue has been finalized and is currently out for public review (see Chapter IV. Marine

Mammal Interactions with Salmonids and Human Activities). Comments by the Pacific SRG are included in this report. The final report and its recommendations will be sent to the Secretary of Commerce and then to Congress.

Second Priority

8) The SRG recognizes the problems inherent in defining the Zero Mortality Rate Goal (ZMRG), and the group could not provide a viable alternative. The group recommends that NMFS assess the performance of the ZMRG guidelines in its third-year report to Congress.

The Guidelines for Assessing Marine Mammal Stocks workshop dealt with this issue, and NMFS is considering a final position.

9) The SRG recommends that the use of fishermen logbook data for monitoring marine mammal mortality be discontinued. Such data are not reliable, and the program is a drain of resources from more effective programs.

The logbook data program has been replaced with a postcard reporting system (see Ch. III. Reducing Interactions Between Marine Mammals and Commercial Fisheries).

10) The Pacific SRG recommends research into nonfishery human-caused mortality; specifically, how to quantify such mortality and how to incorporate this mortality into the PBR process. Such research should be given a higher priority as the fishery mortality approaches the PBR for each stock.

No progress has been made on this.

11) It is unknown whether the virtual disappearance of pilot whales from the California coast is a natural phenomena attributable to changing environmental conditions or due to fishery interactions. Research into the current distribution and migration patterns on an opportunistic basis may shed light on these questions. Broad-scale ecosystem studies may suggest reasons for these changes, as well as recent changes in the distribution and abundance of other pinniped and cetacean species in the North Pacific.

Due to the unavailability of funds, no progress has been made on this recommendation.

12) The Pacific SRG recommends monitoring the California squid purse-seine fishery with an observer program because of the lack of current information about marine mammal mortalities in this fishery and the previous interactions thought to occur with the southern California pilot whale population that has since declined in the area.

This fishery has been reclassified as Category II (see Appendix B. 1997 List of Category I and II Fisheries), but funding has not yet been allocated by NMFS for an observer program.

PACIFIC SCIENTIFIC REVIEW GROUP
6th Meeting, 15-17 October 1997
La Jolla, California

Recommendations: Revised Priorities for Research and Management

The following list of research recommendations has been updated. Several previous recommended actions that have been substantially achieved are no longer listed. The current list has not yet been prioritized.

1) The Pacific SRG has previously recommended conducting a comprehensive survey of the Hawaiian archipelago to fill the large gap in our knowledge about the abundance and status of Hawaiian cetacean stocks.

Because Congress has mandated that intensive dolphin surveys be conducted in the eastern tropical Pacific during 1998-2000, neither NOAA ship time, funding for suitable charter vessels, nor NMFS Southwest Fisheries Science Center (SWFSC) personnel will be available to conduct surveys in Hawaii. Instituting observer programs to estimate mortalities would also be problematic because of the small-scale nature of the local fisheries. The problem of dolphins that may be shot at to

discourage them from stealing fish from fishing lines was thought to be a law enforcement and education issue rather than one requiring an observer program.

The SRG recommends that smaller-scale research projects be initiated to assist in monitoring dolphin mortality and trends in abundance, such as:

a) Initiate a comprehensive program to recover stranded marine mammals from the Hawaiian Islands. This would allow trained personnel to examine carcasses for evidence of gunshots or fishery interactions, as well as to collect life history data.

b) Conduct photo-identification studies of bottlenose dolphins and other species that would be good indices of the effects of fishery interactions. Such studies could allow monitoring for evidence of non-lethal gunshots or fishery interactions, to monitor abundance using mark-resight methods to detect potential declining trends, and to take biopsy samples for genetic analysis. Photographs and biopsy samples could also be collected opportunistically during surveys conducted for other research purposes.

c) Conduct radio- or satellite-tracking studies of bottlenose, spinner, and spotted dolphins to determine home ranges and to infer population structure.

d) Update assessments of fisheries interactions with marine mammals. This could be aided by coordination with the Hawaiian monk seal program to obtain observer mortality data from domestic and foreign fisheries operating near Hawaii.

2) The Pacific SRG recommends that monitoring of the Pacific coast harbor porpoise stocks be continued. Although the reduction in effort by the California coastal set-net fishery has apparently reduced mortality, recent data collected by NMFS suggest that the population still may be declining. The status of harbor porpoise stocks in Washington and Oregon also remain unclear.

Monitoring of these stocks should continue, along with studies to determine whether the declines are due to environmental or human-caused factors, as should documenting the population growth rate in the wake of fishery mortalities and population decline. Satellite tracking of Washington harbor porpoises could help determine stock structure.

3) It is unknown whether the virtual disappearance of pilot whales from the California coast is a natural phenomena due perhaps to changing environmental conditions or due to fishery interactions (possibly by the squid purse-seine fishery). Because the California Department of Fish and Game is instituting a new research program on market squid, it would be useful for researchers aboard squid purse seiners to document any incidental or directed mortality that may be occurring. Research into the current distribution and migration patterns may shed light on these questions. Satellite-tracking of pilot whales that are captured and released from purse-seine nets could be attempted on an opportunistic basis.

4) The SRG recommends that NMFS continue to support research on life history, vital parameters and condition indices, and develop population correction factors for California sea lions and Pacific harbor seals. These populations will not continue to increase indefinitely and when abundances stabilize and possibly decline this base of information will be invaluable. Such "historical" data sets would be very useful for assessing and reacting to present declines in the Steller sea lion and harbor seal populations in Alaska, but few such data sets currently exist.

5) The SRG is concerned about the recent decline in the California sea otter population. The SRG recommends that efforts be increased to determine causes of mortality, such as:

a) expanding the efforts of the stranding program to recover carcasses that could indicate the causes of death, and

b) initiating a shore-based observer program to monitor new and expanding coastal fisheries (for example, the finfish trap fishery) to determine whether any sea otter mortality is occurring and contributing to the population's decline.

6) The SRG recommends that coordination on an international level to address concerns regarding transboundary stock issues (e.g., Mexico and California sea lions; Canada and Washington harbor porpoise) continue and be increased.

7) The Pacific SRG supports the recommendation of the Hawaiian monk seal Recovery Team to increase observer coverage of longline fisheries (currently at 4-5%) to a level that produces statistically reliable estimates of mortality.

8) Following the October 1997 meeting described, the Pacific SRG included the following statement in its formal list of recommendation to NMFS:

"Regarding the NMFS Draft Report to Congress on Recommendations for Addressing the Impacts of California Sea Lions and Pacific Harbor Seals on Salmonids and West Coast Ecosystems, the SRG supports the NMFS proposals for:

1) implementation of site-specific management of California sea lions and Pacific harbor seals as outlined in the report;

2) increased efforts to develop safe and effective non-lethal deterrents, and;

3) funding and conducting research to address the information needs identified in the report."

The Pacific SRG was first briefed on the NMFS Draft Report at its May 1997 meeting in Seattle. Because not all members were in attendance during that discussion, the SRG reviewed this issue again at the October 1997 meeting.

The SRG concurs that there can be situations where predation by locally abundant pinnipeds can have negative effects on certain fish stocks and on sport or commercial fishing activities in some cases. The general conditions under which such effects can occur include situations where fish stocks have been reduced in abundance (as a result of habitat degradation, water diversion, over-fishing, etc.), where habitats have been altered, and where fish are concentrated and passage is restricted (by natural and artificial barriers).

The SRG recognized that the current healthy status of Pacific harbor seals and California sea lions is a result of the success of the MMPA in providing 25 years of protection to these populations. The SRG agrees with the NMFS Draft Report that natural predation by pinnipeds is not implicated as a cause of the more recently observed declines in many salmonid stocks on the Pacific Coast. The available information suggests that many pinniped-fishery conflicts are the result of learned behaviors by a relatively small number of individual animals. In this respect, the proposal for site-specific management of small numbers of pinnipeds from healthy populations to protect other important marine resources, such as threatened, endangered or otherwise state-designated fish stocks, is a biologically sound and risk-averse approach to the conservation and management of these resources.

With respect to the recommendation provided in the NMFS Draft Report regarding deterrents, the Pacific SRG strongly endorses the need to develop highly effective, long-term, non-lethal deterrents to pinnipeds (and other species in some cases) that may damage property, destroy fishing gear or catch, or be killed or seriously injured during fishing operations.

The NMFS Draft Report proposes to selectively reinstate authority for the intentional lethal taking of California sea lions and Pacific harbor seals by commercial fishermen to protect gear and catch (see Chapter IV. Marine Mammal Interactions with Salmonids and Human Activities). Pacific SRG members were divided on this recommendation. Although some members thought that this authority as outlined should be granted, other members questioned the presumption that this deterrent was truly effective, and still others were opposed to the proposal. The Pacific SRG concluded that since this question was primarily one of policy rather than of science, a specific recommendation on this point would not be provided.

The Pacific SRG agreed with the information needs identified in the NMFS Draft Report. This NMFS list is more complete and expands upon a previously-made SRG recommendation to conduct region-wide research on the interactions between increasing pinniped populations and other important marine resources.

JOINT MEETING OF THE ALASKA AND PACIFIC SCIENTIFIC REVIEW GROUPS
5th Meeting, 7-9 May 1997
Seattle, Washington

Recommendations

1) A recommendation was adopted that for all of the "shared" marine mammal stocks both the Alaska SRG and Pacific SRG would review the status reports.

2) Given the preliminary nature of genetics data (e.g., nuclear DNA analyses have not yet been completed) and the relatively small sample sizes used, it was recommended that the existing stock structures reported in the Pacific and Alaska SARs for killer whales be maintained at this time, but changing the stock designation may be considered during the next round of revisions. Further, the following were recommended:

a) a detailed cross-matching of all catalogs to derive minimum estimates of abundance for each stock of killer whale in the Pacific and Alaska regions should be performed,

b) creation of a subcommittee with members from both SRGs should be created to discuss killer whale status specifically,

c) encouragement of active killer whale research groups to work together to produce a new estimate of abundance based on all available data as soon as possible, and

d) NMFS should approach Department of Fisheries and Oceans or other suitable fishery agencies in Canada about a list of fisheries which use gear that is likely to entangle killer whales.

3) Regarding the eastern stock of Steller sea lions, it was recommended that estimates of abundance and human-related removals from British Columbia should be included in the status report and in classifying the stock as to being strategic or not.

It was also recommended that:

a) additional genetic information from animals from British Columbia and the West Coast of the United States was needed, but that until such data were available, the currently recognized stock structure should be maintained,

b) the recovery factor (RF) for this stock should be 0.75, and

c) use of the current estimate of Nmin (the minimum estimate of the number of animals in a stock), which was considered reasonable continue.

4) Regarding harbor porpoise, it was recommended that the significant differences found in genetic diversity from animals that were continuously distributed along the west coast of North America and Alaska supported the establishments of stocks within this species in Alaska.

5) Regarding harbor seals, a recommendation was agreed upon that until additional information on genetic diversity based on nuclear DNA is gathered, the existing stock structure suggested in the Pacific and Alaska SARs should be maintained. It was further recommended that:

a) the ANOVA be redone using the stock boundaries;

b) an analysis of the nuclear DNA be undertaken as soon as possible, and that the results of all of the genetic studies be incorporated into the next status review for this species;

c) areas for which additional samples are needed to better understand the stock structure of harbor seals in Alaska should be identified by NMFS as soon as possible;

d) for the Gulf of Alaska stock of harbor seal an RF of 0.5 should be used for this stock at this time, and the status of this stock should be classified presently as non-strategic;

e) for the Bristol Bay stock of harbor seal an RF of 0.5 should be used, while for the Southeast Alaska stock of harbor seal an RF of 1.0 should be used; and

f) a summary of locations where genetic samples have been previously collected be prepared.

6) It was recommended that a review of the original "Discovery Tag" data for fin whales be reviewed prior to changing the existing stock structure for fin whales.

7) It was recommended that where estimates of Nmin did not incorporate uncertainty or were not considered conservative, RF values should be less than 1.0.

8) It was noted that a key problem related to the PBR system was problematic for ice seals (spotted, ribbon, ringed, and bearded), because reliable abundance estimates for each stock had never been made and substantial human-related mortality took place, and where none of these stocks had been classified as strategic in the past. Another recommendation agreed upon was that abundance estimates for these stocks should be determined as soon as possible.

9) It was recommended that all members of both SRGs should receive copies of the NMFS workshop report on serious injury, as soon as it was available. In addition, future joint meetings were recommended on an as-needed basis.

10) It was recommended that in the future the SARs should include explicit statements regarding how Nmin estimates were derived.

11) Regarding northern fur seals, it was recommended that NMFS:

a) determine whether the ratio of bull counts to pup counts was constant over time, as a check on whether the correction factor was likely to have remained constant over the last 15 years;

b) develop a new correction factor for this stock based on more recent information on pup and non-pup survival and rates of reproduction; and

c) if a new correction is determined to be necessary, and if appropriate, consider reviewing the depleted status of this stock, given that the historic estimate of abundance would not change, while the current estimate of abundance will likely increase.

12) There was general agreement that mortalities of Steller sea lions were likely taking place incidental to fisheries in Russia and Canada as well as in the United States. There was a recommendation that such mortalities should be included in the status report for this stock and other stocks, as appropriate (e.g., harbor seals: southeast and western stocks, Steller sea lions: western and eastern stocks, Alaska harbor porpoise: eastern and western stocks; bowhead whale, gray whale, humpback whale: stocks in the eastern North Pacific, and all stocks of killer whale).

13) It was recommended that a default value for the coefficient of variation (CV) of 0.2 be used in the estimate of Nmin for the Bristol Bay stock of beluga whale. It was further recommended that NMFS develop as soon as possible a CV for the correction factor for this stock based on the radio telemetry data used to derive the correction factor. It was also recommended that where years for which no estimate of mortality were available, they not be included in estimating the average mortality over the previous five years.

14) It was recommended that an appendix should be added to the 1996 Alaska Marine Mammal Stock Assessment Report that summarizes the various observer programs that have been conducted over the last five years.

15) Regarding Cook Inlet beluga whales, it was noted that, as agreed at the last Alaska SRG meeting, the estimate of Nmin did not incorporate any uncertainty because there was no estimate of the CV for either the count of belugas or the correction factor in the estimate of Nbest (the point estimate of abundance). After some discussion, it was recommended that a more conservative approach should be taken, and that the second estimate of abundance described in the text of the 1996 Alaska Marine Mammal Stock Assessment Report be used instead because it did include an estimate of CV for the estimate of abundance (i.e., the estimate of 881 animals for Nbest).

It was also recommended that:

a) the satellite tagging should proceed as planned, but, if at all possible, NMFS should support annual surveys to determine abundance at least through the year 1999 (i.e., 1997, 1998, and 1999); and

b) the Chair would draft a letter to the NMFS Office of Protected Resources recommending that funding be allocated to support such a survey.

16) It was recommended and agreed that NMFS should reevaluate its policy of restricting funding for the purpose of responding to stranding events and should include support for travel, at least in Alaska.

17) Regarding North Pacific sperm whales, it was recognized that the stock structure presented in the 1996 Alaska Marine Mammal Stock Assessment Report is likely incorrect, as is the stock structure currently recognized by the IWC. Therefore, it was recommended that NMFS should place additional priority on expanding efforts to get biopsy samples from live and/or stranded sperm whales throughout the North Pacific because without this information it would not be possible to develop classification criteria under the ESA and MMPA.

ALASKA SCIENTIFIC REVIEW GROUP
6th Meeting, 21-23 October 1997
Seattle, Washington

Recommendations

The following recommendations were adopted by the Alaska SRG.

1) FWS should finalize its report on the 1994 survey for sea otters in the vicinity of Kodiak Island and in general should discontinue the practice of using the stock assessment report as the initial source for a particular piece of information. Further, a letter will be drafted from the Alaska SRG to FWS reiterating its recommendation to only include information in the stock assessment reports, for which at least a draft report is available detailing the methods and analyses used to generate the data in question. It was agreed that at the next meeting, the Alaska SRG should conduct a review of how consistent it had been in its reviewing of the NMFS status reports with regard to this recommendation.

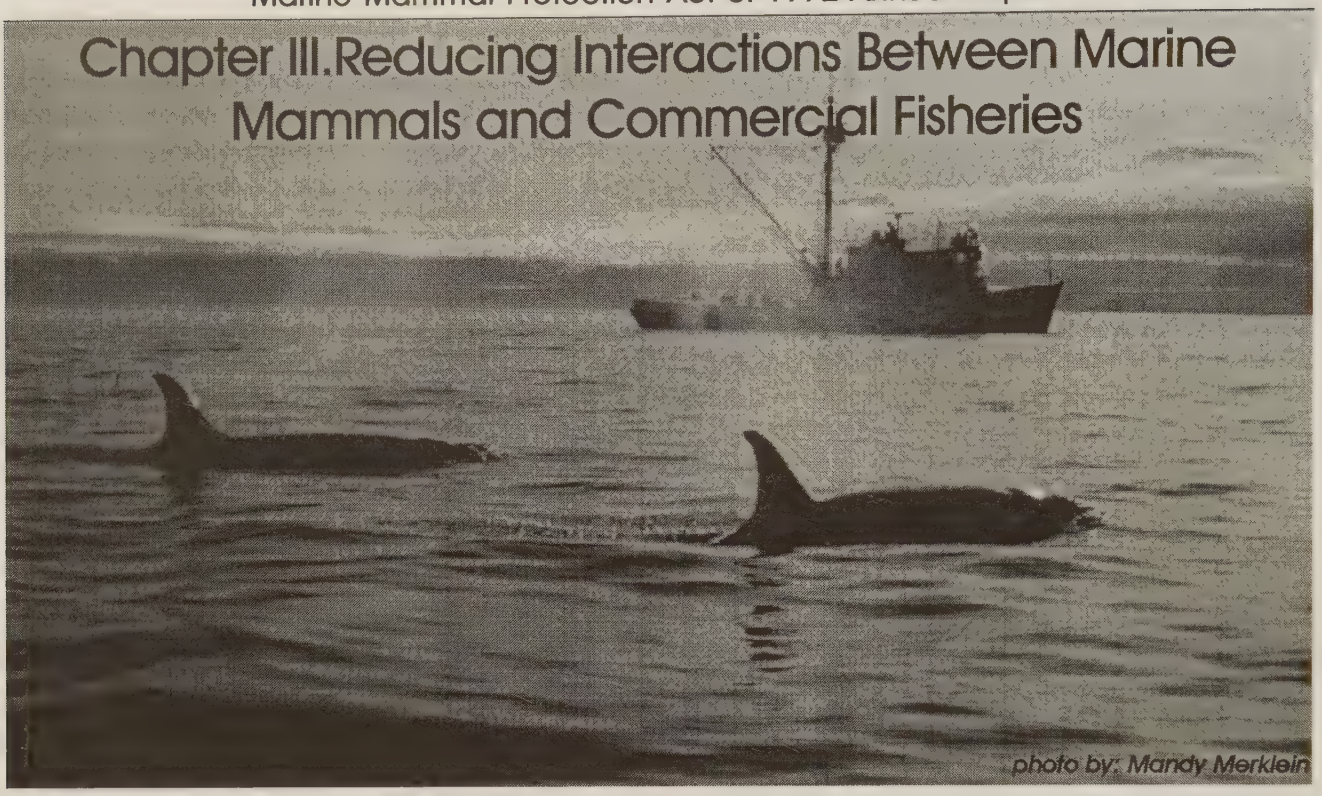
2) FWS should finalize a decision regarding the merits of a range-wide survey for walrus and report this decision to the Alaska SRG.

3) NMFS should expand its efforts to collect tissue samples from harbor seals for use in genetic analyses. SWFSC should be invited to participate at the next meeting of the Alaska SRG to present a summary of recent work on population genetics, as it relates to harbor seals.

4) Both NMFS and FWS should consider mechanisms for managing marine mammal populations at the "small area" level without having to make changes in the MMPA during the next reauthorization process in FY98. One approach would be to calculate a PBR-type number for subareas within the distribution of a stock.

5) Both NMFS and FWS should consider mechanisms by which stock assessment reports for all species of marine mammals in Alaska could be jointly published in a single report or compendium.

Chapter III.Reducing Interactions Between Marine Mammals and Commercial Fisheries



The Marine Mammal Protection Act (MMPA) was amended by Congress in 1994 to establish a new long-term regime for governing interactions between marine mammals and commercial fisheries. Final regulations implementing this program were published in 1995 after considerable public involvement and comment (60 FR 45086).

The 1994 Amendments to the MMPA established the following goals: (1) reducing incidental mortality or serious injury of marine mammals occurring in the course of commercial fishing operations to below the Potential Biological Removal (PBR) level within six months of enactment and (2) further reducing these mortalities and serious injuries to insignificant levels approaching a zero mortality and serious injury rate within seven years.

The Annual List of Fisheries

NMFS must classify all U.S. commercial fisheries into Category I, II or III, based on whether or not the fishery has a frequent, occasional, or a remote likelihood of causing incidental mortality and/or serious injury of marine mammals, respectively. NMFS defined Category I, II, and III fisheries based on the annual level of incidental mortality and serious injury of marine mammals relative to each stock's calculated PBR level.

Definitions of Category I, II, and III Commercial Fisheries

In 1997, the fishery classification criteria consist of a two-tiered, stock-specific approach that first addresses the total impact of all fisheries on each marine mammal stock, and then addresses the impact of individual fisheries on each stock. NMFS went through the following decision process when assessing each fishery for which data are available:

Tier 1: Tier 1 considers the cumulative fishery mortality and serious injury for a particular stock. If the total annual mortality and serious injury across all fisheries that interact with a stock is less than or equal to 10% of the PBR level of that stock, then all fisheries interacting with this stock are placed in Category III. Otherwise, these fisheries are subject to Tier 2 standards.

Tier 2: Tier 2 considers fishery-specific mortality for a particular stock. Fisheries under Tier 2 fall into one of three categories.

Category I: If the total annual mortality and serious injury of a stock in a given fishery is greater than or equal to 50 percent of the calculated PBR level of that stock, then the fishery is placed in Category I.

Category II: If the total annual mortality and serious injury of a stock in a given fishery is greater than 1 percent and less than 50 percent of the PBR level of that stock, then the fishery is placed in Category II.

Category III: If the total annual mortality and serious injury of a stock in a given fishery is less than or equal to 1 percent of the PBR level for that stock, then the fishery is placed in Category III.

Information Used to Classify Commercial Fisheries

NMFS bases its classification of commercial fisheries on a variety of different types of information. The best source of information on the level of fishery-specific marine mammal incidental serious injury and mortality is a fishery observer program. Thus, if data from an observer program are available, NMFS will use this information to classify the fishery. However, because only some commercial fisheries have been monitored by observer programs, other information may also be used to classify fisheries.

If data from fishery observer programs are not available, NMFS may also use the following sources of information to classify fisheries: fishers' reports made formally through the Marine Mammal Authorization Program, stranding data, logbook data from the Marine Mammal Exemption Program, alternative observer programs that use platforms such as aircraft and non-fishing vessels, and other sources of information.

Exceptions to this classification scheme can be made if the data on which the classification is based are scientifically questionable. For example, if the coefficient of variation is unreasonably large for mortality estimates from an observer program, NMFS may determine the level of serious injury and mortality by evaluating other factors, such as the fishing gear type used or whether or not the fishing season occurs during a time of high marine mammal abundance.

Publication of the List of Fisheries

NMFS must publish the annual List of Fisheries (LOF). Proposed changes to the LOF for the following year are published in the spring or early summer. Public comments received during the 90-day comment period are considered when developing the final LOF, which is published during the late fall or early winter.

For each fishery, the LOF must include the number of vessels or participants in that fishery and list which marine mammal stocks or species interact with that fishery. Because the focus in the law is on "injuries and mortalities" to marine mammals, any marine mammal that has been injured or killed in a particular commercial fishery is included in the table.

Definitions of U.S. Commercial Fisheries in the List of Fisheries

Fisheries in the LOF are defined by the broad or specific geographic area in which they operate, the gear type used, the method used, and the target species. NMFS will, whenever possible, define fisheries in a manner which is consistent with federal, regional, and state fishery management plans or programs, in order to:

- reduce confusion caused by having multiple names for the same fishery;

- provide a "common name" for a fishery that can be used by NMFS, fishers, and state and regional fishery managers;

- allow NMFS to more easily collect information on fishery statistics, such as the number of participants, target species landed, length of fishing season, etc.; and

- help NMFS meet its statutory obligations by coordinating registration under the MMPA with existing fishery management programs.

In the future, NMFS may have sufficient information to subdivide certain commercial fisheries into components that have different levels of impact to marine mammal stocks. This approach may help NMFS focus management actions on certain "hot spots" where there are documented high impacts to marine mammal stocks. NMFS will continue to seek public comment on the optimum way to define commercial fisheries and will modify the LOF as necessary to reflect changes in U.S. fisheries.

The 1998 List of Fisheries

A proposed List of Fisheries (LOF) for 1998 was published on May 27, 1997 (62 FR 28657) and the final LOF for 1998 is set to be published in February 1998 (63 FR 5748). NMFS received four letters of public comment on the proposed 1998 LOF. Two comments specifically addressed the Mid-Atlantic coastal gillnet fishery. The remaining comments requested justification for the current categorization of several Category II and III fisheries. The *Federal Register* notice provided NMFS's responses to these comments. The 1998 final LOF did not change the categorization of any commercial fisheries, but did include minor administrative changes to reflect the stock designations and the status of marine mammal stocks as described in the final 1996 Stock Assessment Reports.

A table providing a list of all U.S. commercial fisheries was published in the *Federal Register* notice announcing the final LOF for 1998. This list is found in Appendix B.

Monitoring Programs

One way that NMFS determines the impacts that U.S. commercial fisheries have on marine mammal stocks is through fisheries observer programs. Observer programs are one of the best sources of reliable, objective data on the levels of takes of marine mammals that occur incidental to commercial fishing operations. The purpose of fishery observer programs is to obtain statistically reliable estimates of incidental mortality and serious injury of marine mammals in commercial fisheries, to determine the reliability of fishers' reports, and to identify changes in fishing methods or technology that may decrease incidental marine mammal mortality and serious injury.

Five Category I and II fisheries were observed in 1997 for interactions with marine mammals:

Category I:
* Northeast multispecies sink gillnet fishery
* Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics longline fishery
* California/Oregon thresher shark/swordfish drift gillnet fishery

Category II:
* Mid-Atlantic coastal gillnet fishery
* Atlantic squid/mackerel/butterfish trawl fishery

Observer Program Rotation Workshop

An internal NMFS workshop to develop a process and a rotation schedule for monitoring MMPA Category I and II commercial fishermen is scheduled for June 15-16, 1998. Participants at this meeting will discuss issues involving a possible rotational schedule of observer programs to review case to observer programs which may illustrate these issues, to develop criteria for the design of a rotational program, and to discuss development of alternative qualitative monitoring programs for years when quantitative programs are not conducted.

Alaska Marine Mammal Observer Program

The summer of 1999 will mark the beginning of the Alaska Marine Mammal Observer Program to monitor incidental takes of marine mammals by commercial fisheries in Alaskan nearshore waters. What sets this program apart from other fisheries observer programs in Alaska is the low level monitoring approach. Observers will only be collecting data for the minimum number of fishing days deemed necessary to gain an adequate level of confidence in the data collected. Fishers may have an observer on-board only a couple of times each season, depending on the fishery.

This observer program will focus on Alaskan fisheries currently placed in Category II by NMFS. These fisheries have been determined to have "occasional" incidental serious injuries and mortalities of marine mammals. As a part of getting the word out to fishers, NMFS representatives attended commercial fishing expositions to discuss the features of the future program with them. Infor-

mal discussions were held and brochures highlighting the major aspects of the program were distributed. Additionally, public or "open door" meetings will be regularly hosted by NMFS Observer Program Coordinators in Alaska as the start of the program draws near. These gatherings will allow fishers to ask questions, voice their concerns, and suggest methodology which is vital to the ongoing development of observer programs.

Once the program commences, regular meetings will be held in major ports on a weekly or monthly basis. These meetings are designed to provide fishers and other interested parties with an opportunity to meet the NMFS Observer Program Coordinators in their local area and address any additional questions or concerns they may have about the program. At these meetings there will be up-to-date results from observer data collected in each region. This information will also be posted in major ports for public information.

At the end of the fishing season, these data will be analyzed by the NMFS National Marine Mammal Laboratory in Seattle, and the results will be published in a timely manner for public record.

Registration Requirements for Commercial Fishers

Commercial fishers who participate in Category I or II fisheries in the LOF must register in the Marine Mammal Authorization Program (MMAP). Registration under the MMPA is administered by NMFS Regional Offices, and the registration procedures differ between NMFS Regions. Information on region-specific registration requirements for Category I and II fisheries will be published along with the final LOF for 1998 in the *Federal Register* in early 1998.

The MMPA states that NMFS should, to the maximum extent practicable, integrate registration of participants in Category I or II fisheries under the MMPA with existing state or federal permit systems. Between 1995 and 1997, NMFS integrated registration in the MMAP with pre-existing state and federal fisheries permit systems for most fisheries in Category I and II. Over the past two years, these efforts have resulted in reduced paperwork for both NMFS and commercial fishers, and a total of over 22,500 fishers registered, with the majority of these not needing to register separately under the MMAP and to pay the federal registration fee.

The first NMFS office to successfully integrate registration under the MMPA was the Northwest Regional Office (NWR). In 1995, the NWR integrated the registration of the Oregon swordfish floating longline fishery and the Oregon blue shark floating longline fishery with the permit system operated by the State of Oregon, and integrated the registration of the Puget Sound salmon drift gillnet fishery with the State of Washington. In 1997, the NWR integrated registration of all Washington and Oregon Category I and II fisheries with the state fishing license renewal process. In 1996, the Alaska Regional Office successfully integrated the registration of all Category II fisheries with the State of Alaska system for registering commercial vessels and permitting commercial fishers. In 1997, the Northeast Regional Office integrated MMAP registration with federal and/or state permit processes for the following fisheries: Gulf of Maine/Mid-Atlantic lobster trap/pot fishery, the Atlantic squid/mackerel/butterfish trawl fishery, and the Northeast multispecies sink gillnet fishery. The Southeast Regional Office and the Southwest Regional Office are in the process of integrating MMAP registration for Category I and II fisheries in their regions.

For fisheries in which the granting and administration of authorizations has not been integrated with state licensing, registration, or permitting systems, owners of vessels or gear must register with the NMFS Region in which their fishery operates. NMFS Regional Offices annually send renewal packets to participants in Category I and II fisheries that have previously registered with NMFS; however, it is the responsibility of fishers to ensure that registration or renewal forms are submitted to NMFS at least 30 days in advance of fishing. If fishers have not received a renewal packet by January 1 or are registering for the first time, requests for registration forms should be sent to the appropriate NMFS Regional Office. Registrants must return the registration form and a $25 fee to the appropriate NMFS Regional Office. NMFS will send the vessel owner an Authorization Certificate, a program decal, and reporting forms within 30 days of receiving the registration or renewal form and application fee.

All vessel owners or operators or fishers (in the case of non-vessel fisheries) in Category I, II, or III fisheries must report all mortalities or injuries of marine mammals that occur incidental to their commercial fishing operations. These reports of marine mammal mortality or injury are to be submitted on postage-paid forms provided by NMFS and sent to NMFS Headquarters in Silver Spring, Maryland.

In 1997, NMFS received approximately 200 reports of injuries and/or mortalities from commercial fishing vessel operators. Appendix C summarizes self-reported injuries and mortalities by species and by fishery.

The Integrated Program

Sections 117 and 118 of the MMPA are directly related to one another. These sections direct NMFS to complete Stock Assessment Reports, to convene Scientific Review Groups, to publish the List of Fisheries, to convene take reduction teams in order to form take reduction plans, and to meet both short- and long-term goals for reducing incidental takes of marine mammals. These are all components of a comprehensive program designed to reduce interactions between marine mammals and commercial fishing operations.

The Stock Assessment Reports required under section 117 indicate whether the status of a marine mammal stock is considered "strategic" and provide much of the data NMFS uses to classify fisheries under section 118 in the LOF. The formation of a take reduction team to reduce interactions between marine mammals and commercial fisheries is dependent on a fishery's classification in the LOF and whether its status is strategic according to the Stock Assessment Reports. In addition, the Stock Assessment Reports provide much of the data used during the development of the take reduction plans. Scientific Review Groups (SRGs), formed pursuant to section 117, review and make recommendations on the Stock Assessment Reports and the LOF. The results of observer programs, which are used to collect data on the level of incidental mortality and serious injury in Category I and II fisheries, are presented in the Reports. As NMFS begins to implement take reduction plans in order to meet the short and long-term goals of the MMPA, the SARs and SRGs will continue to play a critical role as NMFS monitors fisheries to ensure that incidental marine mammal mortalities and serious injuries decline over time to insignificant levels.

Take Reduction Teams and Take Reduction Plans

Requirements for the Development and Implementation of Take Reduction Plans

The 1994 Amendments to the MMPA established a long-term regime for governing interactions between marine mammals and commercial fishing operations that included the development and implementation of take reduction plans.

Section 118(f) of the MMPA requires that NMFS develop and implement take reduction plans designed to assist in the recovery or prevent the depletion of strategic marine mammal stocks that interact with Category I or II fisheries. A strategic stock is:

1) a marine mammal species that is listed as endangered or threatened under the Endangered Species Act (ESA);

2) a marine mammal stock for which the human-caused mortality exceeds the calculated potential biological removal (PBR) level for that stock; or

3) a marine mammal stock that is declining and likely to become listed as a threatened species under the ESA.

The PBR level is the maximum number of animals, not including natural mortalities, that may be annually removed from a marine mammal stock while allowing that stock to reach or maintain its optimal sustainable population level.

The immediate goal of a take reduction plan is to reduce, within six months of its implementation, the mortality and serious injury of strategic stocks incidentally taken in the course of commercial fishing operations to below the PBR levels established for those stocks. The long-term goal is to reduce, within five years of its implementation, the incidental mortality and serious injury of

tions to insignificant levels approaching a zero mortality and serious injury rate, taking into account the economics of the fishery, the available existing technology, and existing state or regional management plans.

NMFS must establish take reduction teams to prepare draft take reduction plans. Team members must have expertise regarding the conservation or biology of the marine mammal species to be addressed in the take reduction plan, or the fishing practices which result in the incidental mortality or serious injury of such species. Members should include representatives of federal agencies, each coastal state that has fisheries that interact with the species or stocks, appropriate Regional Fishery Management Councils, interstate fisheries commissions, academic and scientific organizations, environmental groups, all commercial and recreational fisheries groups and gear types which incidentally take the species or stocks, Alaska Native organizations or Indian tribal organizations, or others as the Secretary of Commerce (i.e., NMFS) deems appropriate. Take reduction teams are not subject to the Federal Advisory Committee Act, and meetings of the teams are open to the public with prior notice of the meetings made public in a timely fashion.

The take reduction team is to submit a draft take reduction plan to NMFS not later than six months after the team has been established. Take reduction plans must include:

* a review of information in the final SARs and any substantial new information that may have become available since the publication of the SARs;

* an estimate of the total number and, if possible, age and gender of animals from the stocks that are being incidentally killed or seriously injured each year during the course of commercial fishing operations;

* recommended regulatory or voluntary measures for the reduction of the incidental mortality and serious injury; and

* recommended dates for achieving the specific objectives of the plan.

The goal is to develop a draft take reduction plan by consensus. In the event consensus cannot be reached, the take reduction team advises NMFS, in writing, on the range of possibilities considered by the team, and the views of both the minority and majority. Not later than 60 days after the submission of the draft plan, NMFS is to publish it in the *Federal Register* the draft plan as well as any changes proposed by NMFS with an explanation of the reasons for these changes. In addition, NMFS will propose regulations to implement the plan for public review and comment for a period not to exceed 90 days. Not later than 60 days after the close of the public comment period, NMFS will issue a final plan and implementing regulations.

In implementing a take reduction plan, NMFS may, where necessary to protect or restore a marine mammal stock or species covered by such a plan, promulgate regulations that may include, but are not limited to, measures to:

1) establish fishery-specific limits on incidental mortality and serious injury of marine mammals in commercial fisheries or restrict commercial fisheries by time or area;

2) require the use of alternative commercial fishing gear or techniques and new technologies, encourage the development of such gear or technology, or convene expert skippers' panels;

3) educate commercial fishers, through workshops and other means, about the importance of reducing the incidental mortality and serious injury of marine mammals in affected commercial fisheries; and

4) monitor the effectiveness of measures taken to reduce the level of incidental mortality and serious injury of marine mammals in the course of commercial fishing operations.

NMFS and the take reduction teams are to meet every six months, or at other intervals as NMFS determines are necessary, to monitor the implementation of the final take reduction plans until such time as NMFS determines that the objectives of the plan have been met.

NMFS will amend the final plan and implementing regulations if necessary in consultation with the team.

NMFS's Approach to Establishing Take Reduction Teams

The coordination process to form take reduction teams was initiated by NMFS in 1995. Recognizing the benefits of using professional facilitators in the development of plans that rely on the involvement of stakeholders representing a wide variety of interests, NMFS contracted a professional facilitator with expertise in environmental dispute resolution to conduct a pilot study to explore processes for the development of take reduction plans.

NMFS then contracted a group of professional facilitators in late 1995 to assist in the development of six potential take reduction plans. The facilitators' role in the development of each take reduction plan were to:

* assist in the interviewing of potential team members,
* select sites and provide public notice of team meetings,
* facilitate the meetings,
* develop draft meeting summaries,
* submit team travel expenses to NMFS for payment, and
* assemble the team's draft plan and submit it to NMFS within the time frame specified by the MMPA (six months from the date of establish ment of the team).

Each take reduction team was established using the same general process. Before each team was formed, the NMFS Office of Protected Resources and the appropriate NMFS Regional Office would forward a list of potential team members to the facilitator for that team. The list identified persons that had either worked with NMFS in the past on issues related to marine mammal bycatch or that had worked with NMFS on other teams or committees because of their expertise in marine mammals or fisheries. The facilitator's interview process was also a method for identifying other potential team members. At the end of the interview process, the facilitator for each team submitted a list of recommended team members to NMFS, and the Director of the Office of Protected Resources reviewed and approved the list, in consultation with the Assistant Administrator for Fisheries and the appropriate Regional Director(s). The publication of a *Federal Register* notice identifying the team members established the team.

Six take reduction plans were given highest priority regarding development and implementation of take reduction plans to reduce the incidental bycatch of several strategic marine mammal stocks (see Figure 1, page 27).

They were:

* the Gulf of Maine Harbor Porpoise Take Reduction Plan,
* the Atlantic Offshore Cetacean Take Reduction Plan,
* the Pacific Offshore Cetacean Take Reduction Plan,
* the Atlantic Large Whale Take Reduction Plan,
* the Mid-Atlantic Take Reduction Plan, and,
* the Alaska Steller Sea Lion Take Reduction Plan.

Harbor Porpoise Take Reduction Plan

NMFS established the Gulf of Maine Harbor Porpoise Take Reduction Team (HPTRT) on February 12, 1996 to address incidental takes of the Gulf of Maine/Bay of Fundy stock of harbor porpoise *(Phocoena phocoena)* in the Northeast multispecies sink gillnet fishery. The HPTRT included representatives of the sink gillnet fishery, NMFS, the Marine Mammal Commission, state marine resource management agencies, the New England Fishery Management Council (NEFMC), environmental organizations, and academic and scientific organizations.

Description of the Fishery

The Northeast multispecies sink gillnet fishery is a Category I fishery managed by NMFS and the NEFMC under the Northeast Multispecies Fishery Management Plan (as authorized by the Magnuson-Stevens Fishery Conservation and Management Act, or Magnuson-

Conservation and Management Act, or Magnuson-Stevens Act). Fishers participating in the Northeast multispecies sink gillnet fishery operate year-round in the nearshore and offshore waters from Maine to Rhode Island. They set their nets along the sea floor to target groundfish; specifically cod, haddock, hake, pollock, flounder, monkfish, and dogfish. Vessels are typically small (30-50 ft or 9-15 m) and operate from ports throughout New England. Each vessel sets between 40 and 200 nets, depending on the target species. Each net is 50 fathoms (30 ft or 9 m) long and nets are tied together in strings of 1-30 nets. The fishery currently includes approximately 300 vessels.

Description of the Marine Mammal Bycatch

Incidental mortality of harbor porpoise in this fishery has been of concern since the late 1980s. The estimated average mortality of harbor porpoise killed incidental to this fishery from 1990-1995 was 1833 animals, while the calculated PBR level for this stock is 483 animals. Although the primary species of concern for bycatch reduction measures in this fishery has been harbor porpoise, this fishery also has incidental mortality of the Western North Atlantic stock of Atlantic white-sided dolphins (*Lagenorhynchus acutus*). The estimated average mortality of white-sided dolphins killed incidental to this fishery from 1990-1995 was 121 animals, and the PBR level for this stock was 192 animals. For more information on these marine mammals stocks, see Chapter II. Marine Mammal Stock Assessment Program.

Elements of the Team's Draft Plan

The HPTRT submitted a consensus draft plan to NMFS on August 8, 1996. The team's draft plan represented a comprehensive approach to the problem of harbor porpoise incidental take and included:

Figure 1. Take reduction plans/teams timeline of major events

	Pacific Offshore Cetacean	*Atlantic Offshore Cetacean*	*Gulf of Maine Harbor Porpoise*	*Mid-Atlantic*	*Large Whale*
Date convened	Feb. 15, 1996 (61 FR 5385)	May 23, 1996 (61 FR 25846)	Feb. 12, 1996	Feb. 25, 1997 (62 FR 8428)	Aug 6, 1996 (61 FR 40819)
First meeting	Feb. 13-14, 1996 (61 FR 5385)	May 29-30, 1996 (61 FR 25846)	Feb. 14-15, 1996 (61 FR 5384)	Mar. 4-5, 1997 (62 FR 8428)	Sept.16-17, 1996 (61 FR 48131)
Draft submitted to NMFS	Aug. 15, 1996	Nov. 25, 1996	Aug. 8, 1996	Aug. 25, 1997	Feb. 5, 1997
NMFS publishes draft TRP & proposed regs	Feb. 14, 1997 (62 FR 6931)	Draft TRP & proposed regs not published	Aug. 13, 1997 (62 FR 43302) Comment period reopened and extended to 1/14/98 (62 FR 65402)	Draft TRP & proposed regs not published	Apr. 7, 1997 (62 FR 16519)
NMFS publishes final plan and final regs	Oct. 3, 1997 (62 FR 51805)		Final TRP & final regs not published		Interim final on July 22, 997 (62 FR 39157); final TRP & final regs not published
Follow-up meetings	May 1998 recommended in final TRP		Reconvened Dec. 16-17, 1997		
Draft EA/EIS	Available with proposed rule	Draft EA available for review 11/4/97 (62 FR 59657); Comment period on EA extended from 12/4/97 to 1/4/98 (62 FR 63518)	Available with proposed rule		Available with proposed rule
Final EA/EIS	Final EA completed September, 1997				

• A Core Management Plan consisting of a schedule of time/area closures and periods when pingers would be required was recommended for each of the established management areas. The plan built on closures already instituted by the NEFMC; and

• An Implementation Plan that included recommendations regarding:

a) Detailed census of the gillnet fleet;

b) Outreach, training, and certification programs for all fishers who use pingers;

c) Coordination and consultation with Canadian counterparts regarding the reduction of harbor porpoise takes in Canadian waters;

d) High priority for enforcement of the HPTRP;

e) Coordination of HPTRT's efforts with those of the Mid-Atlantic Take Reduction Team; and

f) The reconvening of the team to provide periodic evaluations of the plan.

Figure 2. HPTRP time/area closures and periods during which pinger use would be required as proposed by NMFS in August 1997.

Downeast Area:	
Aug. 15 to Sep. 13	Closed
Mid-coast Area:	
Jan. 1-31	Closed
Mar. 1 to May 15	Closed
Sept. 15 to Dec. 31	Pingers required
Massachusetts Bay Area:	
Feb. 1-28/29	Pingers required
Mar. 1-31	Closed
Apr. 1-30	Pingers required
South Cape Cod Area:	
Feb. 1-28/29	Pingers required
Mar. 1-31	Closed
Apr. 1-30	Pingers required

Status of the Plan

Soon after the HPTRT submitted its plan to NMFS, the NEFMC implemented Framework Adjustment 19 to the Northeast Multispecies Fishery Management Plan. This action opened the Mid-Coast area to gillnet fishing with pingers during November and December. Because the NEFMC actions altered the assumptions upon which the HPTRT's consensus proceedings were based, NMFS modified the HPTRT's draft plan to be consistent with the fishery management measures while ensuring that the goal of the plan would still be met.

On August 13, 1997, NMFS published a proposed rule to implement the HPTRT (62 FR 43302). NMFS' proposed changes to the Core Management Plan are summarized in Figure 2. In the proposed rule, NMFS also proposed changes and provided updates to several non-regulatory aspects of the Implementation Plan.

Since the publication of NMFS' proposed rule, new information on the bycatch levels of harbor porpoise became available that strongly indicated that NMFS' proposed take reduction measures would not reduce harbor porpoise bycatch in the Gulf of Maine to levels below the PBR level. However, results of the Spring 1997 pinger experiment indicated that pingers appeared to be a viable management strategy throughout the year (see Chapter VII. Conservation and Recovery Programs). In December 1997, NMFS reconvened the HPTRT to review this new information and to solicit additional recommendations for more effective bycatch reduction measures. The team reiterated that the goal of the draft take reduction plan is to reduce takes in the Gulf of Maine from 1833 to less than 340 animals per year. To achieve this goal, the HPTRT recommended time/area closures and periods during which pingers should be used (outlined in Figure 3, page 29). These recommendations did not reflect the consensus of the team since all team members were not present for the entire team meeting.

NMFS is currently revising the proposed rule to incorporate the team's recommendations, updated information on harbor porpoise bycatch, and recent NEFMC actions. NMFS expects the revised proposed rule to be published in 1998.

Figure 3. HPTRT recommendations for time/area closures and periods during which pinger use should be required based on December 1997 meeting.

Downeast Area:	
Aug.15 to Sep.13	Closed
Mid-Coast Area:	
Jan. 1 to Mar. 24	Pingers required
Mar. 25 to Apr. 25	Closed
Apr. 26 to May 31 (except Jeffrey's Ledge)	Pingers required
Sept. 15 to Dec. 31	Pingers required
Massachusetts Bay Area:	
Feb. 1-28/29	Pingers required
Mar. 1-31	Closed
Apr. 1 - May 31	Pingers required
South Cape Cod Area:	
Feb. 1-28/29	Pingers required
Mar. 1-30	Closed
Apr. 1-30	Pingers required
Offshore Area:	
Jan. 1 - May 31	Pingers required
Sept. to Dec.	Pingers required

Mid-Atlantic Take Reduction Team

NMFS established the Mid-Atlantic Take Reduction Team (MATRT) on February 25, 1997 to address the interactions between strategic marine mammal stocks and the Mid-Atlantic coastal gillnet fishery. The Mid-Atlantic coastal gillnet fishery historically has had incidental bycatch of primarily two strategic marine mammal stocks, harbor porpoise (*Phocoena phocoena*) and bottlenose dolphins (*Tursiops truncatus*) (Atlantic coastal stock).

Description of the Fisheries

This fishery includes all gillnet fishing from 72° 30' W long. to the North Carolina-South Carolina border, except those fisheries that operate solely within rivers, bays, and estuaries. Target species of this fishery include, but are not limited to: Atlantic croaker, Atlantic mackerel, Atlantic sturgeon, black drum, bluefish, herring, menhaden, scup, shad, striped bass, sturgeon, weakfish, white perch, yellow perch, dogfish, and monkfish. This fishery is estimated to have more than 655 active participants, many of whom target different species seasonally as the fish stocks migrate north and south along the Atlantic coast. The mesh size used in this fishery varies widely, from 12.5 cm (5 in) for shad to 30 cm (12 in) for monkfish. These interstate fisheries are managed via state Fishery Management Plans. Additional state-by-state information on the U.S. Mid-Atlantic coastal gillnet fishery is provided in the draft Large Whale Take Reduction Plan.

Description of the Marine Mammal Bycatch

The offshore portion of the U.S. Mid-Atlantic coastal gillnet fishery that targets monkfish and dogfish has been observed since 1993. Data from the observer program indicate that six harbor porpoise (Gulf of Maine/Bay of Fundy stock) were observed killed in 1995, and 19 were observed killed in 1996.

The following marine mammals have also been taken in observed trips: in 1994 there was one bottlenose dolphin observed killed, in 1995 there were two common dolphins, and in 1996 there were two common dolphins and one harbor porpoise. Information provided to the Mid-Atlantic Take Reduction Team on total estimated mortality of harbor porpoise indicated that 103 and 310 harbor porpoise were killed incidental to the mid-Atlantic coastal gillnet fishery in 1995 and 1996, respectively, with the majority (70%) of the mortalities in February and March and in New Jersey, Maryland, and North Carolina. The fisheries responsible for these mortalities were targeting either dogfish or monkfish. For more information on these marine mammal stocks, see the U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Reports.

Elements of the Team's Report to NMFS

The MATRT submitted a report to NMFS on August 25, 1997. Although the team did not reach consensus on a draft plan, the team's report incorporated both consensus and non-consensus recommendations for harbor porpoise bycatch reduction measures, as well as research and data collection recommendations for coastal bottlenose dolphins. The team's report recommended the following take reduction measures:

Figure 4. Gear requirements for monkfish fishery proposed by the Mid-Atlantic Take Reduction Plan.

Floatline Length:	
New Jersey Mudhole*	less than or equal to 1170 m (3,900 ft)
New Jersey Waters (excluding Mudhole)	less than or equal to 1440 m (4,800 ft)
Southern Mid-Atlantic	less than or equal to 1170 m (3,900 ft)
Twine Size:	
All Mid-Atlantic Waters	greater than or equal to .90 mm
Mesh Size:	
All Mid-Atlantic Waters	30 cm (12 in)
Tie Downs:	
All Mid-Atlantic Waters	Required
Net Cap:	
All Mid-Atlantic Waters	80 nets (nets are 90 m or 300 ft long)

**New Jersey Mudhole: area off New Jersey, with particularly high harbor porpoise bycatch. Defined as an area south of 40°30', north of 30°55', east of the coastline, and west of 73°20'.*

Management and Research Recommendations for Reducing Bycatch of Harbor Porpoise

The team's report recommended modifications of those gear characteristics and fishing activities that appear to be most closely linked with higher harbor porpoise bycatch. The MATRT based its recommendations on the observer data provided by NMFS, which showed patterns or trends where reduced bycatch might be achieved if certain combinations of gear characteristics were used. The report also recommended a schedule of fishery closures in areas and at times most closely linked with high harbor porpoise bycatch based on the observer data.

Time Frame. Information on the dogfish fishery suggested that harbor porpoise takes are concentrated from January through April. Since January takes were highest in New Jersey and lower in the rest of the Mid-Atlantic, the time frame for the management measures proposed by the MATRT reflected the temporal and spatial nature of the takes. These were:

- New Jersey waters, and U.S. waters off New Jersey out to 320 km (200 mi): January 1 through April 30
- Southern Mid-Atlantic waters (MD, DE, VA, NC) and U.S. waters off the southern Mid-Atlantic to 320 km (200 mi): Close the fishery for a block of 20 days between February 1 and April 30. The timing of the closure is to be determined by individual fishers.

Figure 5. Gear requirements for dogfish in the mid-Atlantic coastal gillnet fishery as proposed by the Mid-Atlantic Take Reduction Plan.

Floatline Length:	
New Jersey	less than or equal to 900 m (3,000 ft)
Southern Mid-Atlantic	less than or equal to 635.4 m (2,118 ft)
Twine Size:	
All Mid-Atlantic Waters	greater than or equal to .81 mm
Mesh Size:	
All Mid-Atlantic Waters	less than or equal to 16.25 cm (6.5 in)
Net Cap:	
All Mid-Atlantic Waters	45 nets (nets are 90m or 300 ft long)

Monkfish Fishery

Gear Requirements. The gear characteristics that provided the most bycatch reduction in the monkfish fishery were floatline length, twine size, mesh size, tie downs, and reduced soak time. Because none of the gear characteristics alone were strongly correlated with reduced bycatch, the MATRT recommended a combination of management measures in order to achieve bycatch reduction below the PBR level. Since these measures would be ineffective if effort increased, the MATRT recommended that a net cap or net limit be implemented to keep effort at current levels (see Figure 4, page 30).

Time/Area Closures. Since harbor porpoise bycatch occurs predominantly in the spring and is concentrated in certain areas during different months, time and area closures are intended to displace fishing effort from those areas and at those times of highest bycatch. Because the correlation between gear modifications and reduced bycatch was not clear in the monkfish fishery, and because the observed bycatch of harbor porpoise was concentrated in fairly discrete areas during the spring, the MATRT believed that a closure during times and areas of high bycatch was an important aspect of a successful plan.

The MATRT recognized that additional closures in the monkfish fishery may be implemented as a result of the Monkfish Fishery Management Plan. If the Monkfish Fishery Management Plan mandates a closure during a different time period, then the MATRT recommended that the MATRT be reconvened to evaluate this aspect of the proposed measures.

Dogfish Fishery

Gear Characteristics. Gear characteristics and other measures were chosen to reflect the unique character of the dogfish fishery and to combine those gear characteristics that provided the best correlation to bycatch reduction. For example, the Mud Hole is not a specific area of interest for the dogfish fishery; therefore, the MATRT did not feel the need to distinguish it as a specific management area within New Jersey waters. Tie downs are not used in the dogfish fishery, therefore, they are not included as appropriate gear modifications. A net cap or limit was considered necessary for the dogfish fishery for the same reason as the monkfish fishery, i.e., to ensure that effort does not increase and thereby nullify the bycatch reduction effects of the gear changes (see Figure, 5, page 30).

Other Recommendations. The Team's Report also included consensus recommendations regarding: outreach and education programs for fishers; improvements to the marine mammal observer program; and general management recommendations for other Mid-Atlantic winter ocean gillnet fisheries. In addition, the report details some of the data concerns of the MATRT.

The MATRT did not reach consensus on whether or not a pinger experiment should be conducted in the Mid-Atlantic coastal gillnet fishery to test the effectiveness of pingers as a means of reducing harbor porpoise bycatch in this region. The team's report addressed this issue and includes a summary of members' opinions regarding the proposed pinger experiment in the dogfish fishery.

Management and Research Recommendations for Reducing Bycatch of Harbor Porpoise

The MATRT discussed developing measures to address bycatch of Mid-Atlantic coastal bottlenose dolphins in gillnet fisheries in the Mid-Atlantic. The MATRT determined that there was insufficient information on stock separation, magnitude of bycatch, and fishery characterizations that would hamper efforts to develop a realistic plan to reduce the mortality of bottlenose dolphins that occurs incidental to fisheries in the Mid-Atlantic. For these reasons, the MATRT agreed with a recommendation by NMFS to delay convening a take reduction team for bottlenose dolphins until January 1999 so that the agency would have additional time to gather data to answer critical questions regarding the interactions between fisheries and bottlenose dolphins throughout the range of these animals.

Implementation of the Mid-Atlantic Take Reduction Plan

NMFS is in the process of developing a proposed Mid-Atlantic Take Reduction Plan, which will be based on the take reduction strategies recommended by the MATRT. This proposed take reduction plan is expected to be published in 1998.

The Atlantic Offshore Cetacean Take Reduction Plan

NMFS convened the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) on May 23, 1996 to address interactions between strategic marine mammal stocks and the Atlantic pelagic driftnet, pair trawl, and longline fisheries for swordfish, tuna and sharks. Cumulatively, these fisheries incidentally take Atlantic spotted dolphin (*Stenella frontalis*), bottlenose dolphin (*Tursiops truncatus*), common dolphin (*Delphinus delphis*), pantropical spotted dolphin (*Stenella attenuata*), long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), beaked whales (*Mesoplodon* spp. and *Ziphius cavirostris*), right whales (*Eubalaena glacialis*), humpback whales (*Megaptera novaeangliae*), and sperm whales (*Physeter macrocephalus*) at levels that are estimated to be above the PBR levels established for these stocks. The AOCTRT included representatives of each of the three fisheries, environmental and conservation groups, several states, the Mid-Atlantic Fisheries Management Council, independent fisheries, the marine mammal biological community, and NMFS.

The Team reviewed stock assessment information for each stock, appropriate marine mammal behavioral studies, available mortality and serious injury data for each of the fisheries (broken down by area and season or month), target species catch data, take reduction strategies tested in similar fisheries, and other pertinent information.

Description of the Fisheries

The Atlantic swordfish fishery is managed by NMFS under the Atlantic Swordfish Fishery Management Plan (as authorized by the Magnuson-Stevens Act) and under the Atlantic Tunas Convention Act (ATCA). ATCA directs NMFS to regulate the swordfish fishery as required by the International Commission for the Conservation of Atlantic Tunas (ICCAT). A Total Allowable Catch level is set for the directed swordfish fishery each year; approximately 98% is allocated to the longline/harpoon fisheries and the remaining 2% is allocated to the drift gillnet fishery. The Atlantic tuna fishery is also managed under the authority of ATCA, which authorizes NMFS to regulate the tuna fishery as required by ICCAT. The Atlantic shark fishery is managed by NMFS under the Atlantic Sharks Fishery Management Plan (as authorized by the Magnuson-Stevens Act).

Drift Gillnet Fishery. This fishery typically operates off Cape Hatteras, North Carolina, in the winter and spring, and from Hudson Canyon off Cape Cod to the Hague Line during the summer. Drift gillnets used in this fishery have a mesh size of 45-55 cm (18-22 in), are 60-70 meshes deep, and are set 5.4-9 m (18-30 ft) below the surface. The total length of net that can be set by each vessel is 2.4 km (1.5 mi). The nets are typically set at dusk and retrieved at dawn. There are currently between 12-15 active vessels in the fishery. Swordfish is the primary target of the fishery, although tuna and shark are also caught and landed.

Longline Fishery. The Atlantic longline fishery operates from the Gulf of Mexico and the Caribbean to the Grand Banks and off Newfoundland. Longlines consist of a continuous monofilament mainline suspended from the surface by a series of floats. Gangions with baited hooks are attached to the mainline at regular intervals. The mainline averages about 40 km (25 mi), but may be as long as 128 km (80 mi). There are between 200-400 active participants in the fishery.

Pair Trawl Fishery. The pair trawl fishery operated in pelagic waters off Long Island, New York from 1991 to 1995 (primarily around Hudson Canyon). The fishery used a large mesh net (mesh size of 3-18 m or 10-60 ft) towed between two trawlers to target bigeye tuna. It typically operated from June to October. There were 12 participants in the fishery in 1995.

Description of the Marine Mammal Bycatch

Drift Gillnet Fishery. The mortality estimates from observer data available through 1995 indicated that the level of mortality and serious injury incidental to this fishery was equal to or above the PBR levels for the following strategic stocks: North Atlantic right whales (Western North Atlantic stock (WNA)), common dolphins (WNA), short-finned pilot whales (WNA), dwarf sperm whales (WNA), Mesoplodont beaked whales (WNA), and spinner dolphins (WNA). In addition, the level of mortality and serious injury that occurs incidental to this fishery is above 50% of the PBR level for Atlantic spotted dolphins (WNA) and pantropical spotted dolphins (WNA).

Longline Fishery. The mortality estimates from observer data available through 1993 indicate that the level of mortality and serious injury that occurs incidental to this fishery was equal to or above 50% of the PBR level for pilot whales. The fishery also has observed takes of Risso's dolphins, Atlantic spotted dolphins, pantropical spotted dolphins, and killer whales. It should be noted that the team did not have access to mortality estimates from the 1994/1995 fishing seasons, although it did review observed takes (including a significant number of animals reported to be released alive). Some of these animals released alive were injured. Because national guidelines were not in place for determining which injuries are serious, the team was unable to make specific recommendations regarding these takes.

Pair Trawl Fishery. The mortality estimates from observer data indicate that the level of mortality and serious injury that occurs incidental to this fishery was equal to or above the 50% of the PBR level for common dolphins, a strategic stock. For more information on these marine mammals, see Chapter II. Stock Assessment Program.

In 1993, NMFS authorized the operation of the Atlantic pelagic pair trawl fishery as an experimental fishery, targeting Atlantic tunas. NMFS renewed the permit for this fishery in 1994 and 1995. However, during the team's deliberations, a request to have the fishery be considered an authorized gear type for targeting tunas was denied to prevent the overexploitation of tuna. Representatives of the pair trawl industry remained involved in the development of the take reduction plan. Therefore, although the team's draft plan includes recommendations for reducing bycatch in the pelagic pair trawl fishery, NMFS is not pursuing implementation of these strategies.

Elements of the Team's Draft Plan

On November 25, 1996, the AOCTRT submitted its draft plan to NMFS. The AOCTRT developed comprehensive strategies for each fishery — drift gillnet, longline, and pair trawl. Each comprehensive strategy included a number of activities that are designed to reduce the incidental mortality and serious injury of strategic stocks of marine mammals. The team's plan recommended that several general regulatory and non-regulatory actions be initiated to reduce bycatch of marine mammals in all three fisheries, and that fishery-specific strategies also be implemented.

General Strategies

• Closure of Northern Right Whale Critical Habitat - Even though there is currently no fishing effort for swordfish or tuna currently taking place in these areas, the AOCTRT recommended a closure of all critical habitat for northern right whales to prevent fisheries from expanding into these areas.

• Coordination of Fishery Management Measures - The AOCTRT recommended coordination among fishery management authorities to integrate marine mammal protection measures with other fishery management and conservation activities.

• Educational Workshops and Outreach - The AOCTRT recommended that NMFS develop a program to inform the fishing industry of the problem of marine mammal bycatch and of the potential solutions for reducing bycatch. The AOCTRT recommended that the program include fact sheets, newsletters, workshops, and guidelines for marine mammal releases. The AOCTRT also recommended the establishment of an at-sea "clearinghouse" to relay information to other fishers about areas of high concentrations of marine mammals.

• Technical Advisory Work Group - The AOCTRT recommended the formation of an ad-hoc group of similar composition as the AOCTRT to assist in the implementation of education and outreach strategies, to engage in ongoing discussions of strategies to reduce incidental takes of marine mammals, and to identify gear and fishing technique modifications.

• Research on Cetacean Behavior - The AOCTRT recommended that NMFS conduct research on cetacean behavior, as it relates to fishery interactions, including migration patterns, behavior around fishing gear, auditory responses to noise sources such as pingers, and feeding patterns (i.e., depth, time of day, prey preferences).

• Research on Calculating Minimum Population Estimates - The AOCTRT recommended that NMFS conduct surveys to estimate cetacean stock abundances in seasons other than summer, to conduct some abundance survey program with industry financial support, and, in the absence of more extensive stock surveys, to explore alternative methods of estimating the minimum population estimate for pelagic dolphins.

• Observer Coverage - The AOCTRT recommended that NMFS convene an intra-agency work group to develop a stratified sampling scheme that addresses priorities for the NMFS observer program (in particular, the longline fishery observer program) in such a way that the collection of observer data on protected species is optimized relative to marine mammals, turtles, and fish. The AOCTRT also recommended increased funding for observer coverage in the longline fishery.

• Development of Criteria for Assessing Marine Mammal Injuries - NMFS recommended that the current injury categories in the MMPA mortality/injury report form be reviewed for determining the nature and seriousness of injuries and that NMFS convene a workshop to develop:

1) guidelines for determining and recording serious injury,

2) recommendations for changes and/or additions to observer logs or reporting forms,

3) recommendations for further research including how to monitor previously entangled animals, and

4) recommendations to the fleet on operating procedures when interactions occur to minimize injury and maximize survivorship.

The AOCTRT also recommended that NMFS review how injuries are recorded with the objective of standardizing the data collection and reporting.

• Comprehensive Cetacean Surveys - The AOCTRT recommended that NMFS conduct a comprehensive survey of common dolphins and pilot whales in 1997 and make every effort to ensure the timely analysis and review of these survey data.

• Research on Gear Modifications - The AOCTRT recommended research on gear design and deployment methods, such as: ball drop length (distance between top of net and sea surface), escape panels, and mesh size for drift gillnets; hook, twine, and bait types, soak time, rig configurations, and other characteristics for longlines.

Drift Gillnet Strategies

• Observer Coverage - The AOCTRT recommended 100% observer coverage of all vessels participating in the drift gillnet fishery. If NMFS is unable to place an observer on a vessel due to overwhelming safety concerns, this vessel would be excluded from the fishery.

• Limited Entry - The AOCTRT recommended a limited entry program for the swordfish drift gillnet fishery to exclude new entrants from being allowed into the fishery, as defined in the NMFS proposed rule for Amendment 1 to the Swordfish and Shark Fishery Management Plans.

• Time/Area Closure - The AOCTRT recommended a time/area closure for the fishery from Hudson Canyon south from December 1 to May 30 in order to eliminate the traditional winter season.

• Elimination of the Derby Fishery by Allocating Sets per Vessel - The AOCTRT recommended an allocation

of transferrable sets per vessel and open access, controlled by limited entry and the total number of sets, to the general swordfish quota. This would require removal of the subquota for the drift gillnet fishery as it currently exists.

• Real-Time Monitoring and Evaluation of Marine Mammal Takes - The AOCTRT recommended real-time monitoring and evaluation of marine mammal takes as it has for the swordfish quota.

• Pinger Experiment - The AOCTRT recommended that the fishery undertake a scientifically designed and statistically valid experiment to determine the potential effectiveness of acoustical devices (pingers) in deterring marine mammal interactions. This recommendation included adequate observer coverage to ensure the experiment is statistically valid.

• Buyout Program - The AOCTRT recommended the establishment of a buyout program that would allow each fisher the opportunity to sell their allocation of effort (sets).

Longline Strategies

• Limited Entry - The AOCTRT recommended a limited entry for the pelagic longline fishery.

• Limit Length of Pelagic Longline Gear - The AOCTRT recommended that the length of the longline used in the mid-Atlantic area from August through November 1997 be limited to a maximum length of 24 nautical miles.

• Reduce Maximum Soak Time - The AOCTRT recommended that fishers reduce their maximum soak time by retrieving their gear in the same order it was set (running back on the gear) in the mid-Atlantic area from August through November 1997.

• Move after One Entanglement - The AOCTRT recommended that longliners be required to move after one entanglement and alert other vessels in the immediate area.

• Development of Guidelines for Interactions and Entanglements - The AOCTRT recommended the development and distribution of guidelines for disentangling marine mammals from longline gear.

• Research on Acoustic Systems - The AOCTRT recommended that research be conducted on the use of acoustic devices to mask the sounds of setting and hauling gear or to deter marine mammals from gear.

Pair Trawl Strategies

• Industry Panel - The AOCTRT recommended that the pair trawl fleet organize an industry panel to review the conditions and activities associated with marine mammal takes and operation of the gear by fishery participants.

• Certification of Nets - The AOCTRT recommended that any new net designs for the pair trawl fishery be subjected to "test tank" observation before the construction and deployment of a full size net.

• Industry Trigger to Alleviate Poor Performance - The AOCTRT recommended that the industry panel determine standards for an acceptable level of marine mammal interactions for each pair. If a pair exceeds this standard, it would cease participating in the fishery for the remainder of the season.

• Operator Qualifications - The AOCTRT recommended that any new entrants to the fishery be required to demonstrate their ability to operate their vessels and gear in accordance with specified handling criteria. The implementation of this qualification program would be directed by the industry advisory panel.

The draft plan also recommended:

1) a review of the current information on the status of the strategic Atlantic offshore cetaceans that interact with the drift gillnet, longline, and pair trawl fisheries;

2) a description of these fisheries, including regulatory/management structure;

3) an indication of foreign and other domestic fisheries that interact with Atlantic offshore cetaceans;

4) sources and a summary of observer data;

5) research and data recommendations;

6) draft guidance for handling caught marine mammals; and

7) strategies discussed but not selected.

Status of the Plan

On December 5, 1996, NMFS closed the drift gillnet fishery for swordfish in the Atlantic Ocean through May 29, 1997 (61 FR 64486). NMFS had reinitiated consultation under the Endangered Species Act (ESA) for Atlantic swordfish fisheries due to new information concerning the status of the northern right whale (see Chapter VII. Conservation and Recovery Programs). The closure would ensure that no irreversible and irretrievable commitment of resources was made that had the effect of foreclosing the formulation or implementation of any reasonable and prudent measures while the consultation on the fishery was pending.

NMFS issued a Biological Opinion on the Atlantic Pelagic Fishery (which includes the Atlantic swordfish and tuna fisheries) on May 29, 1997, under section 7 of the ESA. The consultation covered all components of the Atlantic Pelagic Fishery, including the drift gillnet, longline, and hand gear (hook and line, harpoon) fisheries in the western Atlantic, Caribbean and Gulf of Mexico (except billfish). The conclusions of the Biological Opinion pertaining to the drift gillnet and longline fisheries were as follows:

* Continued operation of the drift gillnet component for swordfish, tuna, and shark is likely to jeopardize the continued existence of the northern right whale;

* Continued operation of the drift gillnet component for swordfish, tuna, and shark may adversely affect, but is not likely to jeopardize the continued existence of humpback and sperm whales (and several sea turtles);

* Continued operation of the longline component may adversely affect, but is not likely to jeopardize the continued existence of any endangered or threatened species under NMFS jurisdiction.

The Biological Opinion identified two possible alternatives for avoiding a "jeopardy" decision namely:

* Prohibition of the use of drift gillnet gear for the taking of pelagic swordfish, tuna, or shark, in all areas and at all times; or,

* Implementation of actions that allow for the restricted use of drift gillnet gear, including implementation of portions of the Atlantic Large Whale Take Reduction Plan and the draft Atlantic Offshore Cetacean Take Reduction Plan.

On June 5, 1997 (62 FR 30775), NMFS extended the swordfish drift gillnet fishery emergency closure for a second period of 180 days until November 26, 1997, or until a preferred option to avoid the likelihood of jeopardy was identified and implemented.

NMFS reinitiated consultation on the Atlantic Pelagic Fishery on August 12, 1997, based on new information regarding the implementation of conservation measures to protect right whales and recent information on mortality and recruitment of the right whale population. Consultation considered an assessment of a new reasonable and prudent alternative, which included a prohibition on the use of drift gillnet gear to target swordfish and tunas from November 1 through July 31 and 100% observer coverage. NMFS concluded that the new alternative did not change the basis for the original determination and that continued operation of the drift gillnet fishery, without modification, may adversely affect and is likely to jeopardize the continued existence of the northern right whale. An amendment to the May 29, 1997, Biological Opinion was issued on August 29, 1997, and concluded that the new alternative, if implemented, may adversely affect, but is not likely to jeopardize the continued existence of the northern right whale.

On November 4, 1997, NMFS published a draft Environmental Assessment (EA) (62 FR 59657) on alternatives for implementation of an Atlantic Offshore Cetacean Take Reduction Plan. Public comments on the draft

EA will be accepted until January 4, 1998. The draft EA included information that was not available to the AOCTRT at the time of their deliberations, including new information on the status of northern right whales and a revised estimates of abundance and PBR level for common dolphins. The draft EA described several alternatives for implementation of a take reduction plan, including the team's draft plan, a modified plan for the drift gillnet fishery with a marine mammal bycatch limit, and a modified plan with prohibition of drift gillnet gear. The EA did not indicate a preferred alternative or identify a proposed action for the implementation of a take reduction plan.

On December 1, 1997 (62 FR 63467), NMFS issued a final rule to close the Mid-Atlantic and Northeast Coastal segments of the Atlantic pelagic drift gillnet fishery for swordfish, tuna, and shark through July 3, 1998. This action was necessary to avoid the likelihood that this fishery would jeopardize the continued existence of the northern right whale until more long-term regulatory measures could be issued.

NMFS has delayed implementation of a take reduction plan for reducing takes of Atlantic offshore cetaceans in order to conduct a comprehensive review of the Atlantic swordfish fishery under the broad management objectives of the Magnuson-Stevens Act, the MMPA, and the ESA.

The Pacific Offshore Cetacean Take Reduction Plan

NMFS convened the Pacific Offshore Cetacean Take Reduction Team (PCTRT) on February 12, 1996 to address takes of short-finned pilot whales (*Globicephala macrorhynchus*), mesoplodont beaked whales (*Mesoplodon* spp.), Baird's beaked whales (*Berardius bairdii*), Cuvier's beaked whales (*Ziphius cavirostris*), pygmy sperm whales (*Kogia breviceps*), sperm whales (*Physeter macrocephalus*), and humpback whales (*Megaptera novaeangliae*) in the California/Oregon drift gillnet fishery for thresher shark and swordfish. Members of the PCTRT included representatives of the fishery, environmental groups, the California Department of Fish and Game (CDFG), the Pacific States Marine Fisheries Commission, NMFS, and independent fisheries scientists and whale biologists. Representatives of other groups and agencies (i.e., recreational fishers and the Oregon Department of Fish and Wildlife) were interviewed, but chose not to participate on the team.

The PCTRT considered a full menu of potential take reduction strategies for inclusion in the draft take reduction plan. The team reviewed the literature on incidental taking of marine mammals in drift gillnets and heard presentations on the status of strategic stocks incidentally taken by the fishery, the estimated annual taking of these stocks from observer data, and strategies currently used by the fishery to avoid taking marine mammals. In addition, the team reviewed extensive analyses of observer data (which were gathered over the past five fishing seasons) to determine if there were correlations between incidental take of cetaceans and fishing techniques, gear used, or oceanographic factors that might suggest appropriate take reduction strategies.

Description of the Fishery

The CA/OR drift gillnet fishery is regulated primarily by the CDFG under a limited access permit system. The Oregon Department of Fish and Wildlife issues ten "unlimited" landing permits and offers 44 "limited" landing permits by lottery (although only 15 people applied for permits in 1996). The fishery operates from the United States/Mexico border to waters off Oregon and Washington. The fishery is closed from February through late April. From late April through August, drift gillnets cannot be used to catch swordfish or thresher shark within 75 nautical miles of shore. Only limited restrictions are in place from August through January.

Drift gillnets are tied at one end to a vessel and drift with the current at the other end. Most nets are made of multifilament nylon and are 1.8 km (1nmi) in length. They typically have a stretched mesh size from 45-55 cm (18-22 in). Extender lines, which attach the net to buoys at the surface, suspend the net below the surface. The net is set at night and retrieved at dawn. There are approximately 150 active fishers in the drift gillnet fishery.

Description of the Marine Mammal Bycatch

The mortality estimates from observer data available through 1995 indicate that the level of mortality and serious injury incidental to this fishery is above the PBR levels for the following: sperm whales (CA/OR/WA stock), humpback whales (CA/OR/WA-Mexico stock), short-finned pilot whales (CA/OR stock), mesoplodont beaked whales, and minke whales (CA/OR/WA stock). In addition, the level of mortality and serious injury that occurs incidental to this fishery is above 50% of the PBR level for Baird's beaked whales (CA/OR/WA stock).

Elements of the Team's Draft Plan

On June 27, 1996, the PCTRT reached consensus on a draft plan. The PCTRT submitted its draft plan to NMFS on August 15, 1996. The team believed that no single strategy could meet the goals of the MMPA. Therefore, the team identified four primary strategies which, if implemented as a package, were expected to meet the six-month goal of reducing the takes of strategic stocks to below PBR levels and, to some extent, the long-term goal of attaining ZMRG for all marine mammal stocks. In addition, the take reduction plan includes possible contingency strategies, should the primary strategies prove less effective than anticipated, and additional recommendations to NMFS regarding supplementary data gathering and study activities. The four primary strategies are:

• *Acoustic Devices* — NMFS and the fishery should initiate a multi-year experiment to test the effectiveness of acoustic devices (pingers) beginning in the 1996-97 fishing season before a final take reduction plan has been adopted by NMFS. The success of pingers in reducing overall cetacean incidental take during the 1996 fishing season (August 15, 1996 - January 31, 1997) would determine whether pingers are recommended as a mandatory strategy for reducing takes when the final plan is in place.

• *Gear Modifications* — There should be fleet-wide deployment of a six fathom minimum buoy line extender length on a mandatory basis for the 1997-98 season. NMFS and the PCTRT should review the efficacy of this strategy after the final plan has been in place for at least six months to determine if the minimum extender length should be modified.

• *Skipper Education and Feedback* — NMFS should conduct skipper workshops on the final take reduction plan coupled with expert skipper panels to further generate and consider potential, additional take reduction strategies. Workshop attendance would be mandatory.

• *Reduction in the Number of Drift Gillnet Permits* —The CDFG should continue its policy of not issuing new shark and swordfish drift gillnet permits to replace those that have lapsed. A permit "buy-back" program should be instituted for CDFG drift gillnet permit holders to encourage part-time skippers to leave the fishery permanently. The draft plan also included:

1) a review of the current information on the status of the affected strategic marine mammal stocks;

2) a description of the CA/OR drift gillnet fishery;

3) an analysis of data from NMFS' CA/OR drift gillnet fishery observer program from 1990-1995;

4) recommendations to enhance NMFS' CA/OR drift gillnet observer program; and

5) an evaluation of other potential strategies to reduce strategic stock bycatch in the fishery. The team assumed that each individual strategy would be refined or modified if necessary based upon the initial year results.

Status of the Plan

As recommended by the team, a pinger experiment was conducted in the fishery during the 1996/1997 fishing season. The results of the experiment indicated that cetacean entanglement rates were 75% lower in nets that had pingers. NMFS published a proposed rule to implement the Pacific Offshore Cetacean Reduction Plan on February 14, 1997 (62 FR 6931). Because of the success of pingers in reducing cetacean bycatch, NMFS proposed that pingers be deployed on all nets. All of the other recommendations made by the PCTRT were proposed without changes. In May 1997, the PCTRT was recon-

vened to review the results of the pinger experiment. Based on the results of the experiment, the PCTRT agreed that all fishing vessels should be required to use pingers.

Skipper workshops were held throughout California and Oregon in the summer of 1997. NMFS presented information on the status and content of the draft take reduction plan, and background on the MMPA, and provided a demonstration of pingers, and an opportunity for question and answers. In addition, the workshops included discussions of the current strategies that fishers were using to avoid interactions with marine mammals. Workshop participants were provided a comprehensive field guide to the marine mammals that occur off the California coast. By the last workshop, over 140 vessel owners and operators had attended the workshops.

On October 3, 1997, NMFS published the final rule implementing the take reduction plan (62 FR 51805). Preliminary results from the 1997/1998 fishing season indicate that compliance with the plan is high, and that bycatch of marine mammals should be below the calculated PBR level for all strategic stocks.

The Atlantic Large Whale Take Reduction Team

On August 6, 1996, NMFS established the Atlantic Large Whale Take Reduction Team (LWTRT) to address the incidental bycatch of large baleen whales, specifically the northern right whale *(Eubalaena glacialis)* and the humpback whale *(Megaptera novaeangliae)* in the following fisheries: the Gulf of Maine/U.S. mid-Atlantic lobster trap/pot fishery, the Gulf of Maine sink gillnet fishery, the mid-Atlantic coastal gillnet fishery, and the southeastern U.S. Atlantic shark gillnet fishery. These two large whale stocks are considered strategic under the MMPA because they are listed as endangered under the ESA, and because the level of human-caused mortality is greater than the calculated PBR levels (see also Chapter VII. Conservation and Recovery Programs).

The LWTRT includes representatives from each fishery, NMFS, state marine resource management agencies, the New England Fishery Management Council, the Mid-Atlantic Fishery Management Council, the Marine Mammal Commission, environmental organizations, and academic and scientific organizations.

Description of the Fisheries

Lobster Trap/Pot Fishery. This fishery is managed by both individual states and by NMFS, under the Lobster Fishery Management Plan (as authorized by the Magnuson-Stevens Act). This fishery operates in nearshore and offshore waters in the Gulf of Maine and the mid-Atlantic. Vessels used in the inshore fishery are typically under 15 m (50 ft) in length and have a crew of one to four people. Vessels used in the offshore fishery are typically between 15-30 m (50-100 ft) in length and have a crew of three to five people. Offshore vessels generally fish in waters up to 360 m (1200 ft) deep. There are approximately 14,600 permit holders, including 4000 vessels that fish in offshore waters.

Gulf of Maine and Mid-Atlantic Gillnet Fisheries. See the description of these fisheries under the section of this chapter on the harbor porpoise take reduction plan and the mid-Atlantic take reduction plan, respectively.

Southeast Shark Gillnet Fishery. This fishery is regulated by NMFS under the Atlantic Sharks Fishery Management Plan (as authorized by the Magnuson-Stevens Act). This fishery operates primarily in the winter months in federal waters from Port Salerno, Florida to Savannah, Georgia. Nets are typically 300 m (1000 ft) to 1.6 km (1 mi) in length and are set and fished overnight. There are approximately 16 active fishers in the fishery.

Description of the Marine Mammal Bycatch

Records of whale entanglements in the lobster pot/trap fishery consist entirely of strandings and opportunistic reports of live and dead animals. Recent studies indicate that this fishery incurs 0.4 serious injuries of right whales each year. The PBR level for right whales is 0.4 animals (see Chapter VII. Conservation and Recovery Programs).

Figure 6. Closures and restrictions on the Northeast multispecies sink gillnet fishery required by the interim final regulations implementing the Large Whale Take Reduction Plan.

Location	Dates	Comments
Great South Channel Right Whale Critical Habitat	April 1 - Jun. 30	Sink gear prohibited; exception is the "sliver area"
Great South Channel Right Whale Critical Habitat	July 1 - Mar. 31	Sink gillnet gear restricted
Cape Cod Bay Right Whale Critical Habitat - federal portion	Jan. 1 - May 15	Sink gillnet gear prohibited until right whales leave the area
Cape Cod Bay Right Whale Critical Habitat - federal portion	May 16 - Dec. 31	Sink gillnet gear restricted
Stellwagen Bank/Jeffreys Ledge	yearround	Sink gillnet gear restricted
All other areas in the NE Atlantic	yearround	Sink gillnet gear restricted

There are also records of humpback and right whale entanglements attributed to gillnet gear in the Gulf of Maine, mid-Atlantic, and Southeast, but quantitative estimates of average annual mortality in these fisheries were not available for the team. For more information on these marine mammal stocks, see Chapter II. Marine Mammal Stock Assessment Program.

The Status of the Plan

The LWTRT did not reach consensus on a plan for reducing bycatch of large whales in the Atlantic. The LWTRT submitted a draft report of their deliberations to NMFS, which was used, in part, to develop a proposed and interim final rule which served as the take reduction plan for the fisheries. A proposed rule to implement the Large Whale Take Reduction Plan was published on April 7, 1997 (62 FR 16519). NMFS held 12 public hearings from Maine to Virginia and received approximately 13,000 comments on the proposed rule. As a result, major changes to boundaries of affected areas, gear, and marking requirements, and contingency measures were made. Because the changes from the proposed rule were significant, NMFS issued regulations for reducing bycatch in these fisheries as an interim final rule and accepted additional comments on the rule. A final rule implementing the plan is due to be published in 1998.

Elements of the Interim Final Plan

The interim final rule, published on July 22, 1997 (62 FR 39157) closed right whale critical habitat areas to specific types of fishing gear during certain seasons and modified fishing practices in such a way that would meet the goals of the MMPA without damaging a vital fishing industry (see Figures 6-9, pages 40-41). The plan uses seven strategies to achieve the six-month goal:

• Closure of right whale critical habitats to some gear types during times of the year when right whales are present;

Figure 7. Closures and restrictions on the Mid-Atlantic coastal gillnet fishery required by the interim final regulations implementing the Large Whale Take Reduction Plan.

Location	Dates	Comments
All areas	Dec. 1 - Mar. 31	Anchored sink gillnet gear restricted
All areas	year-round	Restrictions on hauling, stowing, and setting gillnet gear

Figure 8. Closures and restrictions on the Southeast U.S. driftnet fishery required by the interim final regulations implementing the Large Whale Take Reduction Plan.

Location	Dates	Comments
Southeast restricted area	Nov. 15 - Mar. 31	Driftnet gear prohibited; strikenets are permitted under certain conditions
Southeast observer area	Nov. 15 - Mar. 31	Driftnet vessels required to carry observers if fishing in Southeast observer area. Driftnet gear required to be marke.d.

• Restricting the way strike nets are set in the Southeast shark gillnet fishery;

• Requiring that all lobster and anchored gillnets be set in such a way as to prevent line from floating at the surface;

• Requiring all lobster and anchored gillnets to have at least some additional characteristics that are likely to reduce the risks of entanglements;

• Requiring that drift gillnets in the mid-Atlantic be either tended or stored on board at night;

• Improving the voluntary network of personnel trained to assist in disentangling right whales (see Chapter XI. Public Education and Outreach Programs); and

• Prohibiting storage of inactive gear in the ocean.

In addition, all gear covered under this plan must be marked so that the type of gear that entangles cetaceans can be identified, and gear near the surface cannot be allowed to float at the surface.

The use of gear modifications to minimize the risks of entangling large whales will be key to the long-term success of the take reduction plan. To this end, the LWTRT developed lists of acceptable gear technologies currently available that are believed to reduce the likelihood that cetaceans will become entangled, or increase the likelihood that a cetacean will break free from the gear if entangled. These gear technologies include weak links for buoy lines and the use of sinking line for the buoy line or the ground lines. Fisheries may be required to use one or more of these acceptable technologies if they fish in certain areas at certain times of the year.

Figure 9. Closures and restrictions on lobster trap/pot fishing required by the interim final regulations implementing the Large Whale Take Reduction Plan.

Location	Dates	Comments
Great South Channel Right Whale Critical Habitat	April 1 - Jun. 30	Lobster gear prohibited
Great South Channel Right Whale Critical Habitat	July 1 - Mar. 31	Lobster gear restricted
Cape Cod Bay Right Whale Critical Habitat	Jan. 1 - May 15	Lobster gear restricted
Stellwagen Bank/Jeffreys Ledge	year-round	Lobster gear restricted
All other areas	year-round	Lobster gear restricted

Alaska Steller Sea Lion Take Reduction

NMFS has determined that it is not appropriate at this time to establish an Alaska Steller Sea Lion Take Reduction Team. This decision was made after consultation with the State of Alaska. NMFS expects to review this decision when more information becomes available on the mortality and serious injury of Steller sea lions associated with commercial fishing operations.

Differentiation of Serious and Non-Serious Injury in Marine Mammals

As previously stated, one of the mandates of section 118 of the MMPA is to reduce incidental mortality and serious injury of marine mammals that occurs in the course of commercial fishing operations to below Potential Biological Removal (PBR) levels. In addition, the long-term goal of the MMPA is to reduce incidental mortality and serious injury to insignificant levels approaching a zero mortality and serious injury rate.

It has long been clear to NMFS that defining the concept of "serious injury" is integral to implementing the MMPA.

NMFS provided a clear definition of "injury" to marine mammals under the MMPA (50 CFR 229.2). Because NMFS recognized that determining which injuries are likely to lead to mortality, and thus should be considered serious, is tremendously difficult. NMFS defined injury in 50 CFR 229.2 as. . .

". . .a wound or other physical harm. Signs of injury include, but are not limited to, visible blood flow, loss of or damage to an appendage or jaw, inability to use one or more appendages, asymmetry in the shape of the body or body position, noticeable swelling or hemorrhage, laceration, puncture, or rupture of eyeball, listless appearance or inability to defend itself, inability to swim or dive upon release from fishing gear, or signs of equilibrium imbalance. Any animal that ingests fishing gear, or any animal that is released with fishing gear entangling, trailing, or perforating any part of the body will be considered injured regardless of the absence of any wound or other evidence of an injury."

Serious injury is defined in 50 CFR 229.2 as. . . .

". . .any injury that is likely to result in mortality."

On April 1-2, 1997, a workshop was held to address this issue. The objective of the Serious Injury Workshop was to explore a broad range of guidelines that could be used to determine which marine mammals entangled in fishing gear or injured incidental to fishing operations should be considered seriously injured as a result of the encounter.

Survival of Marine Mammals Entangled in Different Types of Gear

The probability that a marine mammal will survive an entanglement in fishing gear depends on the species of marine mammal involved and how, how long, and the type of gear in which the animal is caught. During the workshop, there were discussions of entanglement situations of marine mammals in gillnet, longline, and pot/trap gear.

Gillnet

Marine mammal researchers have found that small cetaceans, such as harbor porpoise *(Phocoena phocoena)* and bottlenose dolphins *(Tursiops truncatus)*, that come into contact and become entangled in gillnets, seldom survive. This idea is supported by a lack of observer and/or fisher observations of live animals released from gillnet gear and from a low frequency of healed wounds consistent with interactions with gillnet gear on dead, stranded marine mammals. However, a few stranded small marine mammals exhibit healed wounds consistent with previous interactions with gillnet gear, so it is clear that not all small marine mammals die as a result of interactions with gillnets.

Gillnet interactions are often identified as the cause of death of stranded harbor porpoise in the mid-Atlantic. Because lacerations and wounds indicative of gillnet interactions may be easily missed during a preliminary necropsy, a detailed protocol has been designed to aid biologists in determining whether or not a gillnet interaction may have been the cause of death. The most common indication of a mortality caused by gillnet gear is

the presence of narrow, linear lacerations in the epidermis caused by the gillnet pressing into the animal's body. Sometimes these lacerations can be used to estimate mesh size and whether the line was mono- or multi-filament.

Large marine mammals, such as humpback whales, right whales, and Steller sea lions may become entangled in gillnets, but often survive the initial contact with the gear. However, the entanglement of larger marine mammals in gillnet gear may cause considerable damage to the gear. A marine mammal may also swim away with a portion of the gillnet wrapped around a portion of its body such as: a pectoral fin, the tail stock, the neck, or the mouth (trailing gear, which can lead to mortality).

Longline

The Atlantic pelagic longline fishery, which targets swordfish and tunas, primarily has incidental interactions with pilot whales (*Globicephala* spp.) and Risso's dolphins *(Grampus griseus).* Both species may become entangled in the mainline or gangions and may be hooked in the body or in the mouth. Although this fishery has a low rate of observed incidental mortality of marine mammals, it has a higher rate of incidental injury of marine mammals. If some of the hooked or entangled animals are seriously injured, the total annual level of mortality and serious injury would increase for this fishery. Nearly all observed marine mammal interactions with this fishery occured north of Cape Hatteras.

Large Whale Entanglement

Large whales become entangled in large- and small-mesh gillnets, pot gear, and unidentifiable line of different types. Documented cases indicate that entangled animals may carry gear for long periods of time and over long distances, may free themselves from the gear, may be freed by the disentanglement network, or may subsequently die as a direct result of the long-term entanglement. Indirect impacts are also possible. For example, entanglement may compromise the animal by causing cuts or impeding mobility or feeding, which may make the animal more susceptible to disease and/or predation.

Workshop participants noted that not all entanglements will result in mortality and indicated that the proportion of entangled animals that survive entanglements is unknown. Participants stressed that a thorough necropsy is necessary to determine the cause of death of large cetaceans and the degree to which an entanglement may have contributed to the mortality. The need for thorough necropsies to determine cause(s) of death was also stressed for all marine mammals.

Pinniped Entanglement

Human-related injuries to pinnipeds occur as a result of entanglement in net or line, internal and external imbedding of hooks, shooting, or other trauma. Typically, it is very difficult to determine the extent of the pathology based solely on an external examination of the animal. Injuries that result from entanglements or hookings may cause major infections that can severely compromise the health of the animal and lead to death.

Physiological Effects of Stress

Hormonal/Physiological Response

Marine mammals may die from physiological responses to stressful events such as live strandings, chase, capture, or interaction with fishing gear. The severity of the stress response depends on the species, age, general health/condition of the marine mammal, and the type and duration of the stressors. Generalizations cannot presently be made about how many marine mammals subjected to a specific stressor would likely die. In general, marine mammals that inhabit offshore waters (e.g., spinner or common dolphins) appear to be more susceptible to stress-related mortality than marine mammals that inhabit nearshore habitats (e.g., coastal bottlenose dolphins).

Muscular Response to Stress

Scientists have found that exposure to chronic stress may cause physical damage to certain tissues, that is caused by extended exposure of the tissue to adrenaline (exposure that lasts longer than minutes or days). Necropsies have identified heart lesions in cetaceans known to have died as a result of being encircled in fishing gear. For

these animals, stress was the likely cause of death. It is unknown what proportion of stressed animals die some time after the stressor occurs.

Determining What Constitutes a Serious Injury

At the Serious Injury Workshop, participants worked toward developing guidelines for "serious injury" determination. It was recognized that guidelines for what constitutes a serious injury in an animal *could* include:

1) any animal that is observed injured in any way or are observed trailing gear,

2) some animals that are observed injured in any way or are trailing gear, or

3) no animals that are observed injured in any way, but are not moribund or are trailing gear.

The workshop participants accepted the second option as the "middle ground" because of observations of living or dead marine mammals with healed injuries and observations of marine mammals that disentangle themselves from fishing lines and/or nets.

The workshop participants separated into two groups, a large whale subgroup and a small cetacean subgroup, and developed possible guidelines for determining what constitutes a serious injury to a marine mammal.

Large Whale Subgroup

This subgroup addressed the entanglements of large whales in fishing line and nets that resulted in animals becoming entangled in some or all of the fishing gear. The subgroup identified many ways that an entanglement could impact an animal, including impeding its locomotion, its ability to feed, its reproduction, or causing systemic injury. Subgroup participants indicated that any entanglement which resulted in an animal trailing gear, such that the animal's mobility or ability to feed was impeded, should be considered a serious injury. However, specific criteria indicating how to determine whether an entanglement impeded locomotion or ability to feed were not identified.

Small Cetacean Subgroup

This subgroup addressed the interactions between small cetaceans and the longline fishery. The subgroup participants indicated animals that may ingest hooks, may be released trailing gear or may be released to swim away abnormally should be considered seriously injured. The subgroup participants indicated that animals that were hooked externally or were released and swam away normally should not be considered seriously injured. The participants stated that any incident that cannot be addressed by the above criteria should be evaluated on a case-by-case basis. Specific criteria indicating the amount of gear a cetacean would have to trail before the animal was considered seriously injured were discussed, but a consensus was not reached.

Other Issues Discussed at the Serious Injury Workshop

Disentangled Marine Mammals

The workshop participants discussed whether or not an animal that has been disentangled by a commercial fisher or by a formal disentanglement response team should be considered in classifying a commercial fishery. This was identified as a concern because there is no incentive for fishers to report an entangled animal to the disentanglement network if disentangled animals will be used to classify a fishery. It was suggested that animals documented as disentangled should be classified as uninjured. However, there was not consensus on this issue.

Legal Considerations

Because information on marine mammal serious injury and mortality is used to classify and manage commercial fisheries, it is important that adequate documentation on the level of serious injury and mortality be provided. The strongest types of evidence of marine mammal interactions with commercial fisheries include data published in peer-reviewed journals or situations where information is collected in a systematic way using an established protocol (e.g., observer programs, necropsy reports). Anecdotal or opportunistic reports of marine mammal serious injury or mortality are less useful, but

may be used to support management decisions. If possible, anecdotal or opportunistic reports should be accompanied by a statement from the individual who made the report and a written statement from a NMFS individual who can assess the objectivity of the individual who made the report.

Injury of Pinnipeds

A brief discussion of injuries reported for pinnipeds indicated that an animal hooked in the mouth (internally) or trailing gear should be considered seriously injured. Some participants felt that an animal with a hook in its body would likely not be seriously injured.

Workshop Report and NMFS Follow-up

The results of this workshop were published as a NOAA technical memorandum. This report will be used to help NMFS develop draft guidelines for what constitutes a serious injury.

Authorization for the Incidental Taking of Threatened or Endangered Marine Mammals

Section 101(a)(5)(E) of the MMPA allows for the take of marine mammals listed as endangered or threatened under the Endangered Species Act (ESA) incidental to commercial fishing operations, if it can be determined that:

1) incidental mortality and serious injury will have a negligible impact on the recovery of the affected species or stock,

2) a recovery plan for that species or stock has been developed or is being developed, and

3) where required under section 118, a monitoring program has been established, vessels are registered, and a take reduction plan has been developed or is being developed.

In order to determine whether commercial fishing activities are having a negligible impact on endangered and threatened stocks of marine mammals, NMFS evaluated the total number of all incidental serious injuries and mortalities due to commercial fishing for each such stock based on information included in final stock assessment reports and in the Environmental Assessment (EA) prepared for the implementation of section 118 of the MMPA.

Negligible impact, as defined in 50 CFR Part 228.3, is "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." Because of the qualitative nature of this definition and limitations on

Figure 11. Classification of ESA-listed Stocks Under Section 101(a)(5)(E)

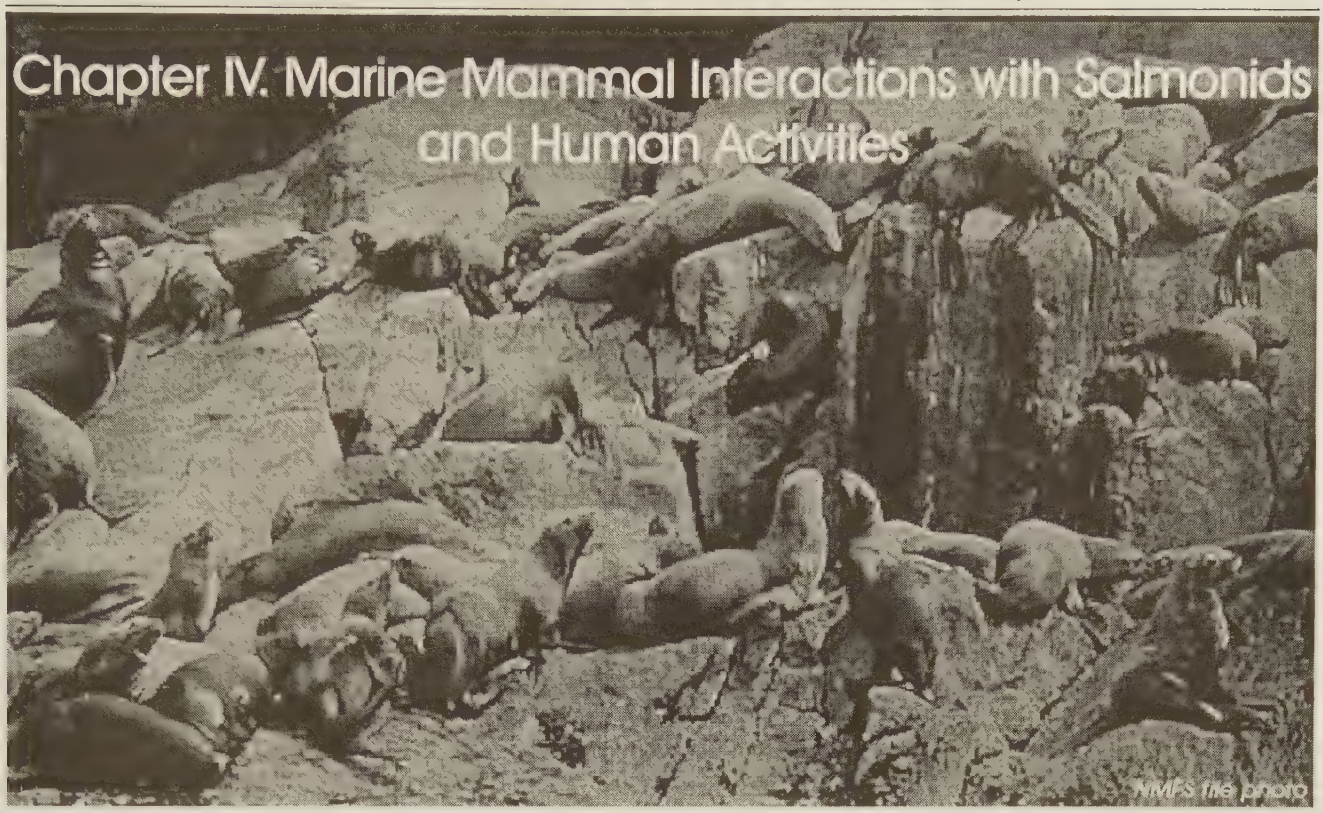
Species	Stock
Mortality and serious injury incidental to commercial fishing operations are having a negligible impact for the following stocks:	
Humpback whale	Central North Pacific stock
Steller sea lion	Eastern stock
	Western stock
Mortality and serious injury incidental to commercial fishing operations could not be determined to be having a negligible impact for the following stocks:	
Fin whale	Western North Atlantic stock
Humpback whale	Western North Atlantic stock
	California/Oregon/Washington-Mexico
Northern right whale	Western North Atlantic stock
Sperm whale	Western North Atlantic stock
	California/Oregon/Washington stock
Hawaiian monk seal	Entire species
There is no documented evidence of fishery-related interactions for the following stocks:	
Blue whale	Western North Atlantic stock
	California/Mexico stock
	Hawaii stock
Bowhead whale	Western Arctic stock
Fin whale	California/Oregon/Washington stock
	Alaska stock
	Hawaii stock
Humpback whale	Western North Pacific stock
Northern right whale	North Pacific stock
Sei whale	Western North Atlantic stock
	Eastern North Pacific stock
Sperm whale	Northern Gulf of Mexico stock
	Alaska stock
	Hawaii stock
Guadalupe fur seal	Entire species

available information, NMFS determined that the application of strict quantitative criteria for making negligible impact findings was not appropriate. However, as a starting point, NMFS considered a total annual serious injury and mortality of less than 10% of a stock's PBR level to be insignificant. This determination was based on the recommendations of a NMFS workshop held in June 1994 to propose guidelines for preparing stock assessment reports. Such a criterion was not, however, the only factor in evaluating whether a particular level of take was considered negligible. The information in the stock assessment reports and the EA had varying degrees of uncertainty, and factors other than PBR level (*e.g.*, population trend) were also considered. Because the negligible impact determinations required some judgement based upon the available information, each finding indicated NMFS' best assessment of whether or not the estimated mortality and serious injury of endangered and threatened marine mammals incidental to commercial fishing operations adversely affected the species or stock through effects on annual rates of recruitment or survival.

In order to determine which fisheries would receive permits under section 101(a)(5)(E), NMFS classified ESA-listed marine mammal stocks into three categories (60 FR 45399). These classifications and associated stocks are listed in Figure 11, page 45. NMFS issued individual three-year permits to fisheries in the first category, and will issue individual permits to participants in conjunction with section 118 authorization certificates, subject to the same terms and conditions.

Although there were no new authorizations for the incidental taking of endangered or threatened species issued in 1997, existing permits were still in place.

Chapter IV. Marine Mammal Interactions with Salmonids and Human Activities



Pinnipeds cause damage to (or loss of) catch in commercial and recreational fisheries, and there are many claims of major economic impact, with complaints regarding such damage having increased in recent years.

Conflict between humans and pinnipeds can take a variety of forms and has become common between expanding pinniped populations and human activities. These conflicts may result in harassment, injury, or death of marine mammals or in the modification of the habitats upon which they depend. Human activities can also exacerbate the effects of natural perturbations in marine ecosystems.

Significant use and alteration of natural resources and habitat have considerably affected pinniped as well as salmonid populations on the West Coast of the United States. Under the protection of the MMPA, pinniped populations on the West Coast of the United States have rebounded, while many salmonid populations have declined. The current estimate of California sea lion (*Zalophus californianus*) numbers ranges from 167,000 to 188,000, and Pacific harbor seal (*Phoca vitulina*) populations are now at very high levels having increased at a rate of 6-8% per year since the mid-1970s.

Over the same period time that some pinniped stocks have increased, there have also been increasing conflicts with human activities such as fisheries and fishery resources (especially salmon). In recent years, salmonid populations have declined drastically along the West Coast raising serious concerns about resource conflicts and the impacts of pinnipeds on salmon listed under the Endangered Species Act (ESA). Although pinnipeds did not cause the declines of salmon listed under the ESA, as salmonid populations decline to low levels, pinnipeds can affect the status and recovery of salmonid populations in some situations. Clearly, the combination of high local predator abundance during salmonid migrations, restricted passage, and depressed fish stocks can result in substantial impacts on local salmonid populations.peds cause damage to (or loss of) catch in commercial and recreational fisheries, and there are many claims of major economic impact, with complaints regarding such damage having increased in recent years.

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Protecting Salmonids from Sea Lion and Harbor Seal Predation

Over the same period time that pinniped stocks have increased in number, there have also been increasing conflicts with human activities such as fisheries and fishery resources (especially salmon). In recent years, salmonid populations have declined drastically along the West Coast raising serious concerns about resource conflicts and the impacts of pinnipeds on salmon listed under the ESA (seven salmonid populations have recently been listed as either threatened or endangered on the West Coast). Although in only the case of the winter-run steelhead population have sea lions been documented to consume a large part of the run, these this demonstrates that a significant portion (65%) of an entire salmonid run can be consumed by sea lions. Clearly, the combination of high local predator abundance during salmonid migrations, restricted passage, and depressed fish stocks can result in substantial impacts on local salmonid populations. Although a combination of factors, including habitat degradation and overfishing may have contributed to salmonid declines, pinnipeds can affect salmonid recovery in some situations.

Section 118(a)(5) of the MMPA contained a new provision to halt the intentional lethal taking of marine mammals, although section 101(c) was maintained to authorize intentional lethal taking if imminently necessary in self-defense or to save the life of a person in immediate danger. However, because of increasing conflicts between growing pinniped populations and their interactions with declining salmonid stocks as well as human activities, section 120 (authorizing lethal removal) was also added to the MMPA in 1994.

California Sea Lion Conflict with Steelhead at the Ballard Locks and MMPA Section 120: Pinniped Removal Authority

The most widely known and intensely studied pinniped/salmonid conflict is California sea lion predation on winter steelhead at the Ballard Locks in Seattle, Washington. Although California sea lions first began appearing in the Ballard Locks area on a somewhat regular basis in 1980, their predation on steelhead was not viewed as a resource conflict until 1985, when a significant decline in the wild winter steelhead spawning escapement was noted. Subsequent scientific studies documented that sea lions were removing significant numbers of adult steelhead that were returning to the Lake Washington system to spawn. Between 1986 and 1992, sea lions consumed 42-65% of the total return of spawning winter steelhead each year and prevented achievement of spawning escapement goals. In spite of intense sea lion deterrence and mitigation efforts from 1985 to 1995, a small number of sea lions returned to the Ballard Locks area each season and preyed on substantial numbers of returning adult steelhead. Although adequate spawning and rear-

ing habitat was available, the winter steelhead population declined significantly during this timeframe down to an all time low of only 70 spawners in 1994.

Because of the precarious status of the Lake Washington winter steelhead population in 1994 and the impact that California sea lions were having on it, the State of Washington applied to NMFS in June 1994 for the authorization under the new "Pinniped Removal Authority" under section 120 of the MMPA (enacted by the 1994 Amendments to the MMPA) for authorization to lethally remove these individual sea lions that prey on winter steelhead migrating through the Ballard Locks. In accordance with section 120, NMFS made a determination on the adequacy of the application and provided public notice of the application with a request for public comments. NMFS also formed the Ballard Locks Pinniped-Fishery Interaction Task Force (Task Force), which was convened to review the pertinent information and public comments and to make recommendations to NMFS on approval or denial of the State's application. In November 1994, after several public meetings, the Task Force completed its report and recommended that approval of lethal removal of individually identifiable predatory California sea lions be allowed only if a number of conditions were met regarding temporary holding of sea lions in captivity, achievement of a specified predation rate, use of deterrence, and other measures.

On January 6, 1995, after consideration of the Task Force recommendations, public comments, and pertinent scientific information, NMFS issued a three-year Letter of Authorization (LOA) to WDFW that authorized the intentional lethal taking of California sea lions that prey on wild winter-run steelhead that migrate through the Ballard Locks. The LOA authorized lethal removal only if the state was in compliance with eleven conditions in the LOA including having a non-lethal deterrence program (acoustic deterrence devices) underway and undertaking efforts to capture and temporarily hold predatory sea lions if practical and feasible. During the 1995 season, no sea lions were lethally removed and only one animal was captured and held in captivity for the duration of the steelhead run. The 1995 steelhead spawning escapement totaled 126 fish, and 8% of the run was consumed by sea lions. Several sea lions were present during the run period in spite of deterrence efforts, and two identifiable sea lions were responsible for most of the steelhead predation.

In September 1995, as required by section 120(c)(5) of the MMPA and the conditions of the LOA, the Task Force was reconvened to evaluate the effectiveness of measures taken by WDFW under the LOA. The Task Force found that sea lion predation posed a continued risk for recovery of the steelhead run because of the continuing low numbers of winter steelhead and recommended modifications to the conditions on the lethal removal authorization to better preserve the steelhead run. In March 1996, NMFS modified the conditions of the LOA based on the Task Force recommendations and additional information on the individual sea lion, which had been held in captivity in 1995, returning to the Ballard Locks and again preying on salmonids. NMFS removed the temporary captive holding condition in the LOA and modified the conditions for lethal removal of a "predatory" sea lion, which was defined as an individually identifiable sea lion that has preyed on returning steelhead and has foraged in the ensonified zone at the Ballard Locks (the area of intense acoustic deterrence). A "predatory" sea lion could be lethally removal by WDFW during a steelhead season (January 1 to May 31) upon being observed foraging at the Ballard Locks.

Upon issuance of the modified LOA, WDFW indicated that it intended to lethally remove predatory sea lions during the 1996 steelhead run. However, shortly after issuance of the modified LOA, NMFS was contacted by Sea World in Orlando, Florida with an offer to receive the predatory sea lions permanently for public display. Prior to this time, no display facility had expressed any interest in permanent holding of these adult male sea lions. Since predatory sea lions would be permanently removed and could not return to prey on steelhead (which was the intent of lethal removal), NMFS and WDFW agreed to capture three predatory sea lions and transfer them to Sea World in May 1996. No sea lions were lethally removed.

In September 1996, the Task Force was again reconvened to review information from the 1996 season and to make recommendations on whether the LOA be extended be-

yond the June 30, 1997 expiration date. The Task Force submitted a report to NMFS recommending that the LOA be extended because insufficient time had passed to evaluate the success of management actions at Ballard Locks. The Task Force opinions on the extension ranged from no extension to a period of eight years (two steelhead cycles) with the majority of the Task Force favoring an extension of four years (one steelhead cycle) to June 30, 2001. The State of Washington subsequently requested that the authorization be extended for an additional eight years (through June 30, 2005) with no change to current terms and conditions. Notice of the proposed extension of the LOA was published in the *Federal Register* on June 19, 1997 (62 FR 33396) with a 30-day public comment period.

On September 23, 1997, after consideration of public comments and the recommendations of the Task Force, NMFS approved a four-year extension to the LOA to June 30, 2001. NMFS determined that there was a need to continue protecting and enhancing the winter steelhead back to the population levels of the mid-1980s, and to allow sufficient time to evaluate the effectiveness of lethal removal. Notice of the extension was published in the *Federal Register* on September 29, 1997 (62 FR 50903).

During the 1997 steelhead season, only 37 hours of sea lion presence was observed at the Ballard Locks in contrast with 116 hours in 1996. The difference in sea lion presence was most evident in the first two months of the year; sea lions were observed for a total of only 16 minutes as compared to over 91 hours in 1996. This difference in sea lion presence appears directly related to the absence of the predatory sea lions, which were captured and placed in captivity at Sea World in 1996. The predatory sea lions accounted for about 60% of the sea lion presence in 1996 and likely would have been at the Locks (based on past patterns) in 1997 had they not been removed. The 1997 observations indicate that permanent removal of known predatory sea lions reduces the presence of sea lions during the steelhead run and may have a beneficial effect on reducing recruitment of new sea lions to the area. The information on sea lion presence collected in 1997 indicates that past predatory sea lions are not replaced rapidly. It also does not appear that new sea lions are frequently exploring the Locks area in the absence of the predatory animals that constantly entered the Locks area (i.e., new animals are not following the predatory sea lions into the Locks area and becoming aware of the site). WDFW reported an estimated 610 winter steelhead escaped to spawn in 1997 which is a substantial increase in spawning escapement over the past four years which ranged from 70 to 234.

California Sea Lion Conflict with Salmonids at Willamette Falls, Oregon

In recent years, a new conflict between California sea lions and salmonids similar to the Ballard Locks situation has developed 128 miles upriver from the Pacific Ocean at a fish passage facility at Willamette Falls in Oregon City, Oregon. Since 1990, the Oregon Department of Fish and Wildlife (ODFW) has reported at least one to three California sea lions foraging on salmonids seasonally from February through May near the fish passage facility at the Falls. ODFW and NMFS marine mammal biologists conducted observations in May 1995 and found four to six male California sea lions were consuming both steelhead and spring chinook salmon in the area below the falls.

ODFW began a monitoring program on sea lion predation at Willamette Falls in 1996 and found at least five California sea lions were foraging at the Falls in April and May. The sea lions were observed consuming 42 spring chinook salmon, 27 steelhead and 20 unidentified salmonids (a total of 89 salmonids). In 1997, observations were conducted by ODFW from April 1 through May 20. During 544 hours of observation in 1997, sea lions were observed consuming 165 salmonids (65 chinook, 39 steelhead and 61 unidentified salmonids) and one Pacific lamprey.

Willamette River winter steelhead and spring chinook salmon numbers have declined in recent years, and unabated pinniped foraging at this critical fish passage site is unacceptable to ODFW. Due to these concerns and the potential for increasing sea lion predation on returning salmonids, NMFS and ODFW have developed a program of non-lethal removal measures to prevent sea lion predation at this site. In February 1997, NMFS and ODFW prepared an draft Environmental Assess-

ment (EA) that examines the environmental consequences of actions for preventing sea lion foraging and predation on salmonids at Willamette Falls in accordance with the National Environmental Policy Act. The proposed non-lethal actions, ranging from deterrence efforts to capture and removal, are authorized under section 109 of the MMPA which allows non-lethal removal of nuisance marine mammals by state and federal officials. NMFS determined that the California sea lions at the Willamette Falls are a "nuisance" because pinniped foraging in this area adversely affects fish passage and salmonids are especially vulnerable at this location to pinniped predation. Further, Willamette Falls is located in the freshwater environment far upriver and well outside the normal range and habitat of California sea lions. Public notice of the draft EA was published in the *Federal Register* on March 13, 1997 (62 FR 11845) with a 30-day public comment period. After consideration of public comments, NMFS completed the final EA in November 1997. The environmental review process led to a conclusion on December 4, 1997 that this action will not have a significant effect on the human environment. Notice of the final EA and responses to public comments was published in the *Federal Register* on January 2, 1998 (63 FR 55).

West Coast Pinniped Report to Congress

To address increasing concerns regarding the impacts of California sea lions and Pacific harbor seals on salmonids and, more broadly, on ecosystems along the West Coast, the MMPA Amendments of 1994 included section 120(f), which required NMFS to:

"conduct a scientific investigation to determine whether California sea lions and Pacific harbor seals

a) are having a significant negative impact on the recovery of salmonid fishery stocks which have been listed as endangered species or threatened species under the Endangered Species Act, or which the Secretary finds are approaching such endangered species or threatened species status; or

b) are having broader impacts on the coastal ecosystems of Washington, Oregon, and California."

Upon completion of the investigation, section 120 required NMFS to enter into discussions with the Pacific States Marine Fisheries Commission (PSMFC), on behalf of the states of California, Oregon, and Washington, to address any issues or problems identified as a result of the scientific investigation and to develop recommendations to address such issues. The recommendations from these discussions, along with the scientific investigation report, were to be made available to the public for review and comment for a period of 90 days, and then submitted to the House of Representatives' Committee on Resources and to the Senate's Committee on Commerce, Science, and Transportation.

Scientific Investigation Report

An investigation into the existing scientific information addressing the issues identified by Congress was undertaken by a Working Group established by NMFS. It was determined at the onset of the investigation that NMFS did not have the resources nor was there sufficient time to conduct rigorous field investigations on the issues identified by Congress within the specified one-year timeframe, so the investigation focused on a review of information from past field studies. The Working Group, consisting of NMFS and state biologists, was selected for their knowledge of salmonids, marine mammals, and the interactions between them. The Working Group compiled and reviewed all available information on the status and trends of California sea lions, Pacific harbor seals, and the seven species of salmonids found in Washington, Oregon, and California. Members of the Working Group also conducted several additional studies to augment existing information thereby extending completion of the report beyond the one-year timeframe. NMFS published the final Working Group report in March 1997 as a part of the NOAA Technical Memorandum series entitled, "Investigation of Scientific Information on the Impacts of California Sea Lions and Pacific Harbor Seals on Salmonids and on the Coastal Ecosystems of Washington, Oregon, and California."

Conclusions from Scientific Investigation

* California sea lion and Pacific harbor seal populations are robust, widely distributed and increasing at rates of 5-7% per year.

* Many salmonid stocks are declining or depressed; six salmonid populations were listed under the ESA at the time of the report and many others were either proposed for listing or candidates for listing.

* Pinnipeds did not cause the declines of salmon listed under the ESA, but when salmonid populations decline to low levels, pinnipeds can affect recovery in some situations.

* The investigation did not result in conclusion that either pinniped species is having a significant negative impact on any wild salmonid population, except winter steelhead that migrate through the Ballard Locks, because of the limitations of the available data.

* Although additional research is needed to fully address this issue, existing information on the seriously depressed status of many salmonid stocks is sufficient to warrant actions to remove pinnipeds in areas of co-occurrence where pinnipeds prey on depressed salmonid populations. Data collected from the Ballard Locks and in the Puntledge River in Canada clearly demonstrates that the combination of high local predator abundance during salmonid migrations, restricted passage, and depressed fish stocks can result in significant impacts on local salmonid populations.

* Pinnipeds cause damage to (or loss of) catch in commercial and recreational fisheries. There are many claims of pinnipeds, especially California sea lions, causing economic impact to fisheries especially in salmon fisheries and in the southern California charterboat fishery.

* Data is lacking on assessing the impact of pinnipeds on coastal ecosystems.

Draft Report to Congress

In June 1996, NMFS began discussions with PSMFC and representatives of Washington Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, and California Department of Fish and Game. Using the information from the scientific investigation as a focus of discussions over the course of eight months, two issues were identified and four recommendations were developed to possibly mitigate any impacts identified through the investigation. In February 1997, the discussions were completed, and NMFS drafted a report to Congress to recommend measures to address issues identified in the discussions with PSMFC and representatives of the coastal states. On March 28, 1997, NMFS published notice in the *Federal Register* (62 FR 14889) on the availability of the draft report to Congress for public review and comment. The comment period ended June 26, 1997.

Issues

Two issue statements on pinniped impacts on salmonids and West Coast ecosystems were identified and are described in the Report. They are as follows:

1) Pinniped Impacts on Salmonids - California sea lion and Pacific harbor seal populations on the West Coast have been increasing since passage of the MMPA in 1972, while many salmonid populations are decreasing. Salmonid populations that are depressed and declining, especially those that are listed or proposed to be listed under the ESA, can be negatively impacted by expanding pinniped populations and attendant predation.

2) Pinniped Impacts on West Coast Ecosystems - Increasing California sea lion and Pacific harbor seal populations and their expanding distribution are negatively impacting commercial and recreational fisheries, damaging private property, and posing threats to public safety.

Recommendations

That draft report also contained four major recommendations:

1) Implement Site-specific Management for California Sea Lions and Pacific Harbor Seals

Establish a framework that would allow state and federal resource management agencies to immediately address conflicts involving California sea lions and Pacific harbor seals. Any lethal takings would have to be within the Potential Biological Removal levels established by NMFS for all human causes of mortality. The three components of the framework are:

a) In situations where California sea lions or Pacific harbor seals are preying on salmonids that are listed or proposed for listing under the ESA, immediate use of lethal removal by state or Federal resource agency officials would be authorized;

b) In situations where California sea lions or Pacific harbor seals are preying on salmonid populations of concern to the state or are impeding passage of these populations during migration as adults or smolts, lethal takes by state or federal resource agency officials would be authorized if:

(i) non-lethal deterrence methods are underway and are not fully effective, or

(ii) non-lethal methods are not feasible in the particular situation or have proven ineffective in the past; and,

c) In situations where California sea lions or Pacific harbor seals conflict with humans, such as at fishery sites and marinas, lethal removal by state or federal resource agency officials would be authorized as a last resort when an individual pinniped fails to respond to repeated deterrence attempts, or when repeated deterrence attempts do not affect the behavior of an individual pinniped over the long-term.

2) Develop Safe, Effective Non-lethal Deterrents

In order to provide an array of options broader than lethal removal to resolve West Coast pinniped problems, there is a pressing need for research on the development and evaluation of deterrent devices and further exploration of other non-lethal removal measures. Potential options need to be evaluated in a concerted, adequately-funded effort to address this issue. Research and development of pinniped deterrence methods should be a research priority for addressing expanding pinniped populations on the West Coast.

3) Selectively Reinstate Authority for the Intentional Lethal Taking of California Sea Lions and Pacific Harbor Seals by Commercial Fishermen to Protect Gear and Catch

Prior to the 1994 Amendments to the MMPA, commercial fishermen were allowed to kill certain pinnipeds as a last resort in order to protect their gear or catch. Although the 1992 NMFS' legislative proposal contained provisions to continue such authority, they were not included in the 1994 Amendments to the MMPA. A limited authorization, based on demonstrated need, should be provided to certain commercial fishermen at specified sites to use lethal means, as a last resort, to protect their gear and catch from depredation by California sea lions and Pacific harbor seals until such time that effective non-lethal methods are developed for their specific situation.

4) Information Needs

An array of additional information is needed to better evaluate and monitor California sea lion and Pacific harbor seal impacts on salmonids and other components of the West Coast ecosystems. Details of such studies are described in the draft Report to Congress.

There is a suite of research needs to answer the questions regarding pinniped impacts to salmonids and coastal ecosystem and NMFS' recommendations. These reflect the need to take management actions immediately in those cases where continued pinniped predation could result in continued loss of individuals within severely depleted salmonid runs. Further, additional research and development should be directed into this arena, but not instead of active management where the situation is deemed critical.

Draft Conclusions

The lack of clear, integrated legislative guidance on resource use in combination with highly polarized constituencies on this issue, compound the difficulties of managing this situation for NMFS. Because of the limi-

tations of the available data, the scientific investigation did not result in a certain determination that either pinniped species (California sea lions or harbor seals) is having a significant negative impact on overall wild salmonid populations. The study did find that in several areas where fish passage is restricted, pinnipeds occur during salmonid migration. It was concluded; however, that even though substantial additional research is needed to fully address this issue, existing information on the seriously depressed status of many salmonid stocks is sufficient to warrant actions to remove pinnipeds in areas where pinnipeds prey on depressed salmonid populations. In terms of the pinnipeds effects on coastal ecosystems, however, no conclusions can be drawn to adequately assess the impacts.

The Draft Report to Congress found that there may be conflicts among provisions of environmental legislation. It also recognized the need for immediate management action and/or active (inseason, in-situ) management in certain situations. NMFS recognizes the risk of loss of biodiversity and the need to preserve present and future options in terms of declining salmonid populations. The loss of the remaining members of endangered salmonids must be weighed against the loss of a small number of pinnipeds from large, healthy populations. NMFS is also aware that there is a risk-averse approach to protecting salmonid stocks and contributing to their recovery.

Although waiting for scientific certainty before instituting management actions can lead to management failures, numerous questions must be answered about the ultimate effects that pinniped populations are having on the recovery of declining salmonid species and the entire coastal ecosystem. As both human and pinniped populations continue to grow and to demand more from coastal resources, conflicts between them are likely to increase as well. This trend suggests that active management will become increasingly important to reduce damage and conflict between humans and common species. The publication of the final Report to Congress is anticipated in 1999.

Public Comments

The issue of resolving pinniped problems on the West Coast is certainly controversial; consequently, NMFS received thousands of comments on the draft report to Congress. Many letters were not responses to the actual draft report, but were part of campaigns by marine mammal protection groups against any or all actions toward sea lions. Although some of the comments supported NMFS' recommendations, a significant amount of them opposed them. This polarity of comments on the recommendations ensures that the re-authorization of the MMPA in 1999 will be controversial, particularly concerning these recommendations as a balanced way of resolving specific pinniped conflicts on the West Coast consistent with the MMPA goal of maintaining all marine mammals at optimum sustainable population levels.

The Pacific Scientific Review Group (SRG) discussed the draft Report to Congress at its May 1997 meeting and supported the recommendations for site-specific management of pinnipeds by state/federal authorities, development of effective non-lethal deterrents, and needed research (see Chapter II. Marine Mammal Stock Assessment Program). However, the SRG did not clearly decide on a recommendation for lethal deterrents by fishermen because of concern for possible shooting of Steller sea lions *(Eumetopias jubatus)* (in areas where California and Steller sea lions co-occur) and the potential perception by fishers that lethal taking is the only effective deterrent.

Gulf of Maine Pinniped-Fishery Interaction Task Force

As a result of increasing pinniped populations interacting with human activities, one of which is aquaculture, the 1994 MMPA Amendments included section 120(h), which required NMFS to convene a task force to provide advice on issues or problems regarding pinnipeds interacting in a dangerous or damaging manner with aquaculture resources in the Gulf of Maine. The Gulf of Maine Pinniped-Fishery Interaction Task Force members were selected from the aquaculture industry, State

government, the scientific community, and conservation organizations. The Task Force was established in January 1995 and met three times for multi-day meetings, visited pen-sites, conducted public hearings, met with salmon growers, conducted surveys, and reviewed literature related to the issue, prior to completion of its report.

In February 1996, the Task Force submitted its final report to NMFS. The report contained consensus Task Force recommendations to mitigate the pinniped predation.

NMFS used the Task Force's recommendations and comments received from the public to prepare its proposed recommendations to the U.S. Congress. The draft report recommended options available to mitigate the pinniped-aquaculture interactions. It was completed on March 17, 1997 (62 FR 12602) and was made available for a 30-day public review and comment period. Highlights of the draft report included the following:

1) The aquaculture industry needs to develop a reporting system to substantiate its claims of damage by pinnipeds, develop and implement standards to prevent damage by predators, take advantage of government assistance in developing deterrence strategies, and develop marketing strategies to help make future losses more sustainable;

2) Congress should clarify whether or not it intended that the lethal take provisions in MMPA section 109(h) be applied to the situation when a marine mammal gets inside a net-pen; and

3) NMFS reiterates its support of the intentional lethal take provision included in its 1992 legislative proposal and recommends that Congress re-examine the need for intentional lethal taking under the MMPA.

In response to public comments, the report has been modified to state that NMFS does not have the authority under MMPA section 109(h) to kill pinnipeds that are discovered within net-pens and to focus the recommendations regarding lethal removal on the specific charge within MMPA section 120(h) rather than on the broad issue of management of abundant pinniped populations.

Recommendations in the final report include the following:

• The salmon aquaculture industry in the Gulf of Maine should collect data on the extent of the impacts experienced by seal attacks on net-pen. The data should include documenting damages caused by the seals, as well as, resources diverted from production to work on the seal predation problem.

• The primary responsibility for preventing and mitigating the effects of seal attacks on aquaculture resources in the Gulf of Maine should rest on the industry itself. The research and development of deterrence/prevention technologies must be initiated by the industry.

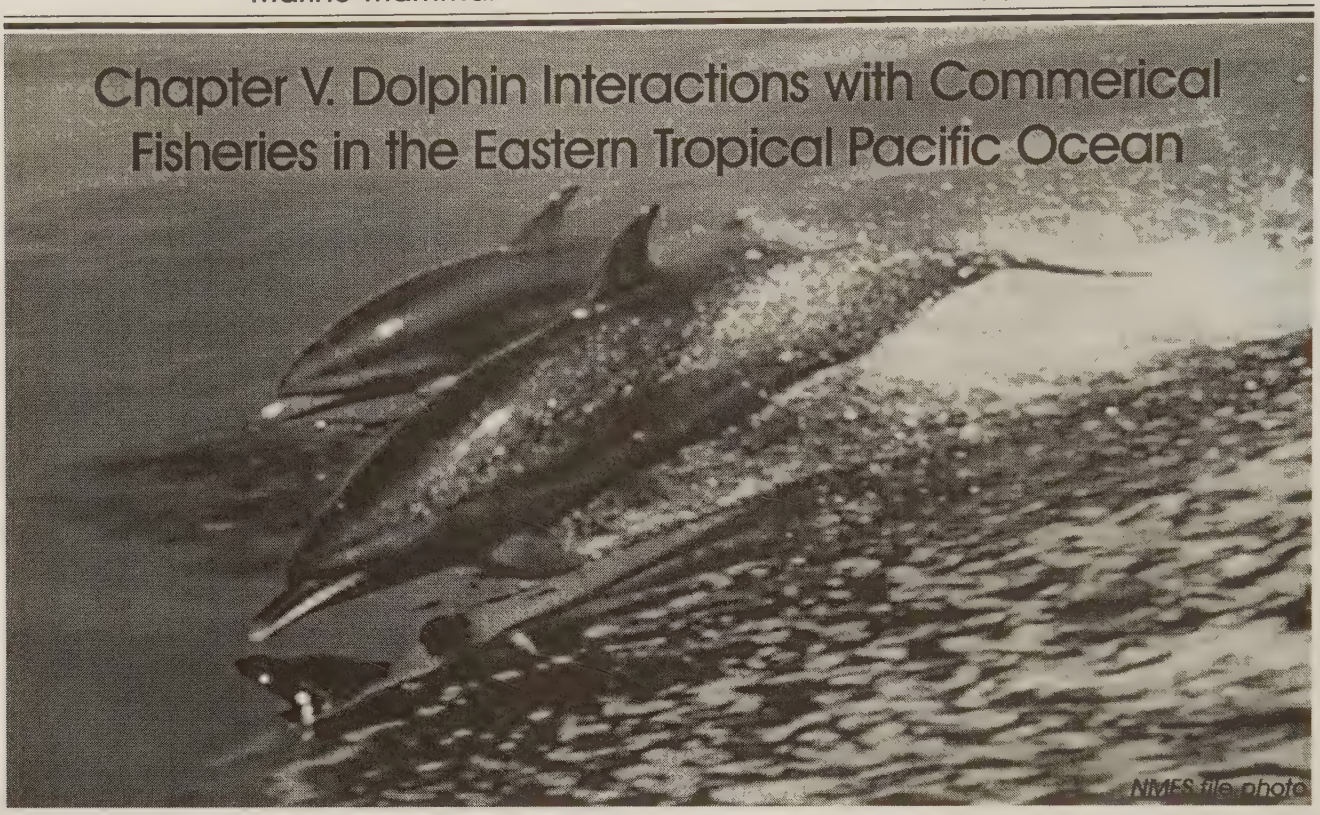
• NMFS has resources that may help resolve the seal predation problem. NMFS has expertise in the behavior and biology of marine mammals, the engineering and design of fishing gear, and other related fields. NMFS, if approached by the industry, may be able to apply these areas of expertise to this relatively new problem. Furthermore, NMFS funds grant programs to which industry proponents may apply for funds to support research and development intent on resolving the seal predation problem.

• At the request of the industry, NMFS will investigate the predator control measures in use in other salmon produce countries and will consider the applicability of MMPA section 102(c)(3), by which NMFS could halt the importation of salmonid products from nations that allow practices inconsistent with the MMPA.

• In the rare event that a seal is discovered to have entered the confines of a net-pen, the grower is left in an intolerable situation that seems to have no legal means of resolution. NMFS believes that lethal methods may be necessary to resolved this and other situations.

NMFS forwarded the report to the Department of Commerce, which then transmitted the report to Congress on August 1, 1997. Copies of the report are now available to the public.

Chapter V. Dolphin Interactions with Commerical Fisheries in the Eastern Tropical Pacific Ocean



The Marine Mammal Protection Act (MMPA) was enacted in 1972, due in large part in response to public reaction to the high levels of dolphin mortality caused by the yellowfin tuna purse seine fishery in the eastern tropical Pacific Ocean (ETP). In the late 1950s, fishermen began using the as yet unexplained association between schools of large yellowfin tuna, over 25 kg (55 lbs) and schools of certain species of dolphin to locate and capture tuna. Observer records of mortality begin in 1972 with the enactment of the MMPA. At that time, the ETP fishery was dominated by U.S. vessels, and annual mortality was estimated at over 350,000 dolphins. With enactment of the MMPA, incidental mortality from fishing by the U.S. domestic fleet began to decline, but participation in the fishery by foreign vessels began to increase. Although the U.S. industry was instrumental in developing gear and procedures for reducing mortality and for releasing animals, foreign vessels were not subject to the requirements of the MMPA, and international fleet mortality, although reduced by procedures and gear developed by U.S. vessels, began to rise as a result of the increase in the number of foreign vessels.

To address the concern regarding increased mortality by foreign vessels, the U.S. Congress amended the MMPA in 1984 to tighten the importation requirements for fish and fish products harvested by foreign tuna vessels in the ETP. The 1984 amendments to the MMPA required that nations exporting yellowfin tuna to the United States have in place a regulatory program for marine mammal protection comparable to that of the United States, and achieve an incidental mortality rate for dolphins in the yellowfin tuna fishery comparable to that of the United States. Those amendments also set a mortality limit of 250 coastal spotted dolphins and 2,750 eastern spinner dolphins for the U.S. fleet in the ETP fishery.

In 1988, Congress again amended the MMPA. Statistics for 1987 showed mortality incidental to foreign fishing effort at 85,185 for the year, while U.S. mortality was under 13,992. By imposing additional requirements on domestic and foreign tuna fishermen, Congress expected that overall mortality would decrease. Those amendments retained the annual quota of 20,500 dolphins killed or seriously injured during the purse seining operations of the U.S. tuna fleet in the ETP, but also added additional requirements applicable to the U.S. fleet.

The amendments also clarified what the Secretary of Commerce must consider when determining whether a foreign nation is taking measures comparable to those of the United States in protecting dolphin in the ETP fishery. These included the same prohibitions that were applicable to U.S. vessels and set specific limits on total dolphin mortality and the percentage of eastern spinner and coastal spotted dolphins in the total mortality. The amended MMPA also required:

1) that an intermediary nation show that it had acted to ban imports of any tuna subject to a U.S. import ban, or face a U.S. ban on its yellowfin tuna;

2) adoption of skipper performance standards;

3) restrictions on sundown sets and the use of certain explosive devices to herd dolphins; and

4) a National Academy of Sciences study on alternative methods of locating and catching tuna, not requiring setting on dolphins.

The 1988 amendments to the MMPA also required certification under the Pelly Amendment for those nations not meeting the comparability requirements of the MMPA for a period of six months. The embargoes that resulted from MMPA requirements were challenged by other countries as being inconsistent with the General Agreement on Tariffs and Trade (GATT). Although never formally adopted by the GATT, a panel report found against the United States' embargoes to be GATT-inconsistent.

In 1990, Congress passed the Dolphin Protection Consumer Information Act (DPCIA). The DPCIA required that tuna labeled as "dolphin safe" meet certain criteria. Under the definition, all tuna harvested in the ETP on a trip where there was any intentional encirclement of dolphins which could not be considered "dolphin safe." The DPCIA did not prohibit tuna that did not meet the "dolphin safe" labeling requirements from being imported, but U.S. tuna canners instituted a voluntary "dolphin safe" tuna campaign where they purchased only "dolphin safe" tuna for introduction to the U.S. market.

The International Dolphin Conservation Act (IDCA) was passed in 1992, with the intent to establish an international moratorium on the practice of harvesting tuna through the use of purse seine nets deployed on or to encircle dolphins or other marine mammals. The United States was not successful in getting any nation to commit to such a moratorium. However, the IDCA limited U.S. dolphin mortality to 1,000 dolphins for 1992 and 800 for the period between January 1, 1993, and March 1, 1994. The IDCA required that the number of dolphins killed or seriously injured decrease from one year to the next. Estimated U.S. dolphin mortality decreased from 19,712 animals in 1988, to 1,004 in 1991, less than 500 in 1992, and 115 in 1993. Because the IDCA required that authorized U.S. mortality decrease each year, the U.S. ETP yellowfin tuna fishery was closed on February 8, 1994, when the incidental dolphin mortality was approaching 115. The IDCA prohibited U.S. citizens from intentionally encircling marine mammals and made it unlawful for any person to sell non-dolphin safe tuna in the United States after June 1, 1994. However, foreign participation in the ETP fishery continued to increase, and mortality was managed under the voluntary international dolphin conservation program under the auspices of the Inter-American Tropical Tuna Commission (IATTC).

The La Jolla Agreement and the Panama Declaration

While U.S. participation in the ETP tuna fishery declined significantly as a result of MMPA prohibitions on encircling dolphins (only a few "dolphin-safe" vessels remained in the fishery), foreign participation in the fishery continued. In the fall of 1992, the nations participating in this fishery convened at the annual meeting of the IATTC and signed the La Jolla Agreement. That Agreement placed voluntary limits on the maximum numbers of dolphin that could be incidentally killed annually in the fishery, lowering the maximum each year over seven years, with a goal of eliminating mortality in the fishery. The United States and the governments of Belize, Colombia, Costa Rica, Ecuador, France, Honduras, Mexico, Panama, and Spain, whose vessels fish for tuna in the ETP, came together again in 1995 and negotiated the Panama Declaration.

The Panama Declaration initiative was the result of the efforts of five environmental organizations, the Center for Marine Conservation, Greenpeace International, World Wildlife Fund, National Wildlife Federation, and the Environmental Defense Fund, who negotiated an initial draft with Mexico and the other nations in the fishery. Because the multi-nation yellowfin tuna fleet fishes in international waters, a binding international agreement is key to successfully protecting dolphins. The signing nations agreed that, contingent on the United States amending provisions of the MMPA for those countries participating in the international dolphin conservation program in the ETP, they would enter into a binding international agreement for the continued protection of dolphin and the entire ETP ecosystem. The Panama Declaration set the stage for the establishment of conservative species/stock specific annual dolphin mortality limits and represents an important step toward reducing bycatch in commercial fisheries with sound ecosystem management.

The Panama Declaration contains provisions for additional protection for individual stocks of dolphins and for other living marine resources, to achieve an ecosystem approach to management of the fishery. The signatory nations expected that, as a result of their actions in reducing dolphin mortality, the United States would amend its laws so their participation in the International Dolphin Conservation Program would satisfy comparability requirements of U.S. law and result in the lifting of embargoes on yellowfin tuna and yellowfin tuna products. Through the International Dolphin Conservation Program, dolphin deaths have been reduced to below 4,000 annually, a level considered non-threatening to dolphin stocks. Total dolphin mortality by the international fleet for 1997 was 3,000. Until implementation of the IDCPA, however, prohibitions on the importation of ETP purse seine-harvested yellowfin tuna from Colombia, Mexico, Panama, Vanuatu, and Venezuela remain in place, as well intermediary nation embargoes on all yellowfin tuna from Costa Rica, Italy, and Japan.

The International Dolphin Conservation Program Act (IDCPA)

In August 1997, Congress passed the International Dolphin Conservation Program Act (IDCPA), amending the MMPA to provide exceptions to the import prohibitions for those nations participating in the international dolphin conservation program in the ETP. Contingent upon the results of research into the effects of chase and encirclement on depleted dolphin stocks, the legislation would change the definition of "dolphin safe" to mean tuna caught in a set without any observed dolphin deaths, rather than tuna caught without encircling dolphins on any set during an entire trip by the purse seine vessel.

The IDCPA is the United States' response to the Panama Declaration. The IDCPA provides the basis for entry into the United States of yellowfin tuna that would otherwise be under embargo because it was harvested by encircling marine mammals, provided the harvesting nation provides documentary evidence of its participation in the International Dolphin Conservation Program and its membership in the IATTC. The IDCPA will also allow U.S. fishing vessels to again participate in dolphin fishing the ETP yellowfin tuna fishery by making sets on dolphins. U.S. citizens crewing on the vessels of other nations in the fishery will be able to take marine mammals during fishing operations outside of the U.S. exclusive economic zone without being in violation of the take prohibitions of the MMPA.

Also, under the IDCPA the definition of "dolphin safe" tuna will change immediately for tuna caught in areas other than the ETP, and then for the ETP if certain findings based upon mandated research are made. Unlike other issues in which NMFS interacts with commercial fisheries, the burden of proof regarding whether or not the practice of setting purse seine nets on dolphins while fishing for yellowfin tuna is detrimental to these dolphin populations is on NMFS. That is, in the absence of significant scientific data supporting the position that the process of chasing and encircling dolphin schools in the pursuit of tuna in the ETP adversely affects dolphin populations in the ETP, the meaning of the "dolphin safe" label in the United States will change in of March 1999.

Unless the Secretary of Commerce determines, on the basis of that research and other relevant information, that intentional chase and encirclement of dolphins is having a significant adverse impact on a depleted dolphin stock in the ETP, tuna harvested in a set where there is no observed dolphin mortality will be considered "dolphin safe." The contrasts with the DPCIA definition, where no tuna harvested during an entire trip is considered "dolphin safe" if there was a set on dolphin during the entire trip.

The IDCPA provides enhanced protection for dolphins and enhanced attention to the conservation of ecosystems and the sustainable use of living marine resources related to the tuna fishery in the ETP. However, the provisions of the IDCPA will become effective only when two certifications are made. The Secretary of State must certify to Congress that a binding legal instrument establishing the International Dolphin Conservation Program has been adopted and is in force, and the Secretary of Commerce must certify that research has begun on the effects of intentional chase and encirclement on ETP dolphins, and that funds are available to complete the first year of the study.

Dolphin-Safe Research Program

The initial objectives of the Dolphin-Safe Research Program initially were:

* to determine whether any modern technologies can be used to detect subsurface schools of large yellowfin tuna in the ETP when the fish are not associated with dolphins

* to identify ways in which dolphins could still be used to locate tuna, with the tuna-dolphin bond being broken before a set is made.

The second line of research listed above was discontinued in 1996, based the results of a workshop held in 1995. Participants at the workshop concluded that practical economic and logistical constraints associated with the remote and wide-spread location of tuna-dolphins associations in the ETP preclude useful further investigation at this time. Ideally, if effective tuna detection technology can be found, the use of dolphin schools as cues to locate these fish could be eliminated. The original technologies investigated included acoustics, optics (lidar), and radar. Radar technologies were quickly identified as inappropriate at the current time and further investigation into this technology was discontinued. Mathematical modeling of estimated acoustic signal propagation in the ETP and initial experiments with various lidar systems indicated that both these technologies have potential for subsurface detection of large yellowfin tuna in the ETP when the fish are not associated with dolphins, so investigations related to these two technologies have continued.

During the period January 1, 1997 through December 31, 1997 the Dolphin-Safe Research Program awarded eight contracts to further its goals. These contracts included three projects investigating various aspects of lidar technology and five projects investigating various aspects of acoustic detection. The lidar projects included the following:

1) investigation of the utility of an airborne Streak Tube Imaging Lidar (STIL) for detecting large yellowfin in the ETP;

2) investigation of the potential for construction of a low-cost lidar; and

3) mathematical modeling of estimated lidar performance and power density levels in the ETP oceanic environment.

All three of these contracts are scheduled for completion during 1998, so final results will be discussed in the next MMPA Annual Report.

The acoustic projects included two separate contracts developing specifications for an acoustic detection system optimized for detection of large yellowfin tuna in the ETP. Another project involved evaluating the probable effect of low-frequency acoustic sounds on marine mammals. A fourth project entailed an experimental study of the effects of blast and acoustic trauma on marine mammals, and a fifth project entailed measurement of swim bladder volumes and tuna reflectivity from freshly-caught large yellowfin tuna from the ETP.

Both projects developing specifications for an optimized acoustic system for detecting ETP large yellowfin made similar recommendations for an active, low-frequency, high decibel towed-array system utilizing various types of sophisticated signal processing to analyze the acoustic signal returns. The proposed systems are very promising, with likely detection distances of 20 or more km (12 mi) for subsurface schools of large yellowfin tuna in the ETP. However, further progress in development of this acoustic system is currently suspended due to the proposed high cost of constructing and testing *in situ* the prototype systems recommended by the contractors.

The projects addressing the potential for acoustic disturbance and trauma in marine mammals were developed in conjunction with the development of recommendations for the most appropriate acoustic technology for detecting large yellowfin in the ETP, in order to determine whether the desired detection technology might have undesirable effects on the marine mammals which also inhabit the ETP ecosystem. These two contracts are scheduled for completion during 1998.

The study to measure swim bladder volumes will provide the first direct measurements of swim bladder volumes in large yellowfin tuna. Swim bladder volume is the controlling parameter in determining the acoustic signature of yellowfin for active acoustic detection systems, so this project will provide critical data for refining the optimal system. This contract is also scheduled for completion during calendar year 1998.

IDCPA Research Progress

Research initiatives actually began prior to passage of the IDCPA in August 1997. Research progress was initiated in July 1997 with a workshop on "Investigation of the potential influence of fishery-induced stress on dolphins in the ETP." This workshop reviewed current knowledge about stress responses in mammals and about the practice of "dolphin fishing" in the ETP, and then developed recommendations for physiological/histological/morphological measures that might practically be sampled in order to evaluate the potential effects that this practice might be having on individual dolphins and on dolphin stocks.

Following passage of the IDCPA in August 1997, Congress appropriated funds for FY98 to initiate various research projects mandated therein. These research projects include:

* three surveys of dolphin abundance in the ETP in 1998, 1999, and 2000 in the ETP

* a literature review of effects of stress on marine mammals

* analyses of historical data for evidence of fishery-related stress

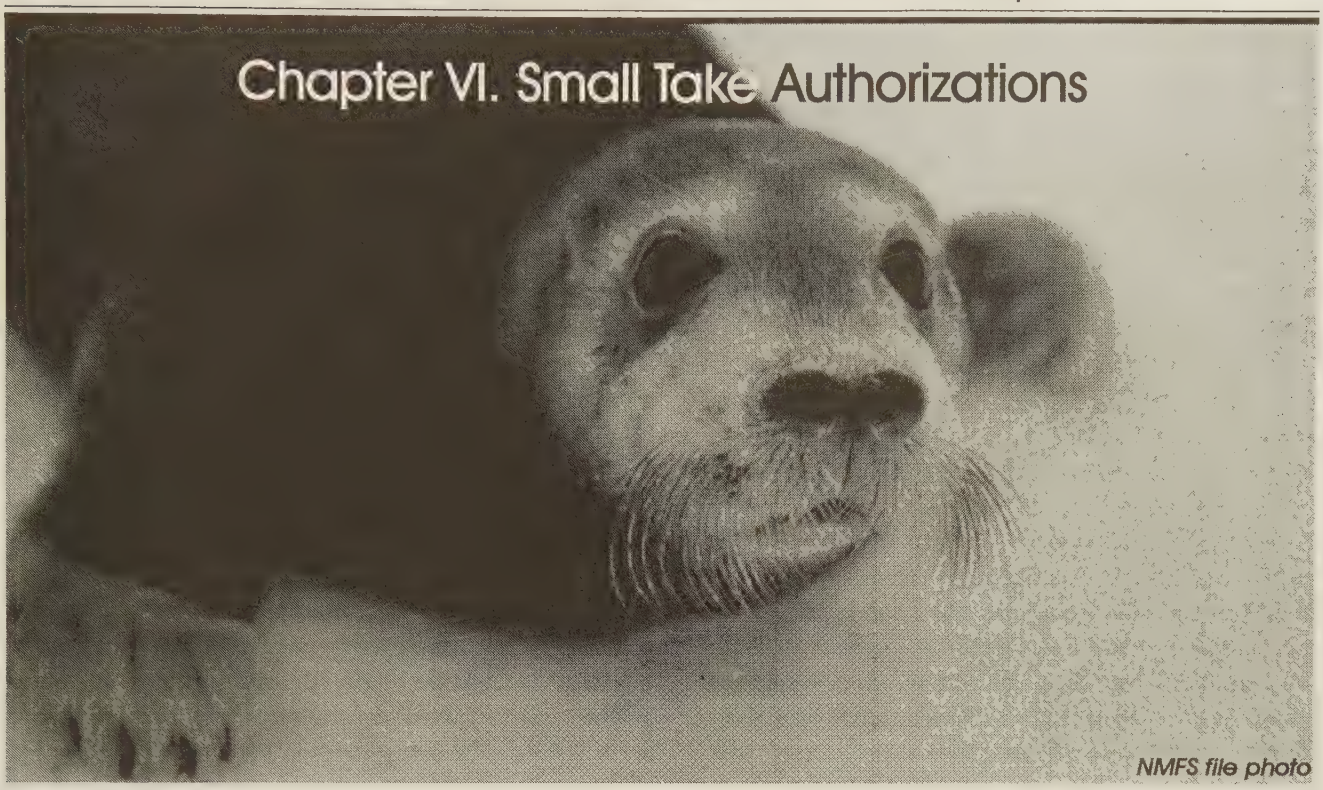
* a necropsy program to sample dolphins killed during routine fishing operations, and

* a chase/recapture experiment to examine physiological parameters in individual dolphins captured repeatedly.

Planning for the initial abundance survey began immediately and included a survey design meeting held during December 1997. Planning will continue in 1998, culminating in departure of the first survey vessels in early August 1998. The literature review was initiated in October 1997 and will be completed by the end of December 1998. Planning for the necropsy program, historical data analyses, and chase/recapture experiment was initiated with the July 1997 workshop and continued throughout the remainder of calendar year 1997.

More detailed results from these research projects will appear in the 1998 MMPA Annual Report.

Chapter VI. Small Take Authorizations



NMFS file photo

Section 101(a)(5)(A) of the MMPA was added in 1981 and mandates that NMFS authorize, upon request, the incidental, but not intentional, taking of a small number of marine mammals by U.S. citizens who engage in a specified, lawful, activity (other than commercial fishing) for periods not to exceed five years per authorization. Before issuing regulations that allow the takes, NMFS must determine that the takes will not have more than a negligible impact on the species requested to be taken and will not have an unmitigable adverse impact on the availability of the species for subsistence hunting. The regulations must prescribe permissible means of taking and requirements for monitoring and reporting the taking.

In 1997, three specific activities were authorized to incidentally take marine mammals under this provision of the MMPA. The authorized activities were:

1) the taking of ringed seals incidental to seismic activities on the ice in the Beaufort Sea;

2) the taking of bottlenose dolphins and spotted dolphins incidental to the removal of oil and gas structures in the Gulf of Mexico; and

3) the taking of a number of species of marine mammals during U.S. Navy ship shock trials off southern California. However, no Letters of Authorization were issued during 1997 for conducting ship shock trials off Southern California.

In 1997, NMFS received two new applications for takings incidental to specified activities, while two other activities previously authorized continued. Those activities that had received prior authorization are:

U.S. Navy Seawolf Shock Trial Application

On June 7, 1996, NMFS received a request from the U.S. Navy for a small take of marine mammals incidental to shock testing the USS SEAWOLF submarine in the waters offshore Norfolk, Virginia, or Jacksonville, Florida, in the summer of 1997. The Navy proposed to shock test the USS SEAWOLF by detonating a 4,500 kg (10,000 lb) explosive charge near the submarine once per week over a five-week period, sometime between

May 1 and September 30, decreasing the distance between the submarine and the explosive each time. Detonations would occur 30 m (100 ft) below the ocean surface in a water depth of 150 m (500 ft). The USS SEAWOLF would be underway at a depth of 19.5 m (65 ft) at the time of the test. For each test, the submarine would move closer to the explosive so the submarine would experience a more severe shock.

On August 2, 1996, NMFS released for public comment proposed regulations that, if implemented, would authorize the harassment, injury, and mortality of a small number of marine mammals incidental to the Navy's shock trial. The proposed rule contained measures designed to minimize loss of marine mammal life and that would require aerial, shipboard, and acoustic monitoring of the planned detonations. The public review and comment period closed on September 17, 1996. While a final rule is expected to be published in late spring 1998, due to a delay in the test program, the Navy has requested the effective date of the five-year rule to be delayed until the year 2000.

U.S. Coast Guard (USCG) Large Whale-Ship Strike Application

On May 31, 1995, NMFS received an application for a small take exemption from the USCG in order to allow a small take of certain marine mammal species incidental to USCG vessel and aircraft operations off the U.S. Atlantic Coast. The application was submitted in response to an order dated May 2, 1995, and was revised in response to a May 19, 1995 court order. In that case, Strahan v. Linnon, the presiding District Court judge ordered the USCG to apply by May 31, 1995, for a small take authorization for northern right whales *(Eubalaena glacialis)*. The USCG also requested authorization of a small take of humpback *(Megaptera novaeangliae)*, blue *(Balaenoptera musculus)*, fin *(Balaenoptera physalus)*, sei *(Balaenoptera borealis)* and sperm whales *(Physeter macrocephalus)*. The application covers USCG vessels and aircraft in the North Atlantic, including responses to marine pollution events, port safety and security issues, law enforcement efforts, search and rescue missions, vessel traffic control, and maintenance of aids to navigation.

Before processing this application, NMFS determined that it would be necessary to first complete consultation under section 7 of the Endangered Species Act (ESA). The USCG submitted a final ESA Biological Assessment of its activities along the U.S. Atlantic Coast on August 3, 1995, and NMFS issued a Biological Opinion on September 15, 1995. As a result of an October 9, 1995, humpback whale strike in the Gulf of Maine, the USCG requested reinitiation of consultation on February 22, 1996. That process was concluded on July 22, 1996 with the issuance of a revised Biological Opinion. During the time period for consultation, processing of the USCG application for a small take authorization was suspended.

Because the July 22, 1996 Biological Opinion concluded that continued vessel and aircraft operations by the USCG are likely to jeopardize the continued existence of northern right whales, and because NMFS has determined that the loss of even a single northern right whale is significant, a negligible impact finding under section 101(a)(5)(A) could not be made for ship strikes of northern right whales by the USCG. As a result, the USCG's June 2, 1995, application for a small take authorization for northern right whales was denied by letter on July 31, 1996. The requested authorization for taking other whale species incidental to USCG operations was not addressed at that time.

In response to concern expressed by the presiding judge in Strahan v. Linnon regarding NMFS' actions on the small take application and other marine mammal authorizations, on October 17, 1996 (61 FR 54157), NMFS announced receipt of the USCG application and offered the public 30 days in which to submit comments on the application, in order to crystallize the underlying issues more efficiently and formally in the public forum. NMFS expects to make a determination on the appropriateness of issuing a proposed rule in response to the application during 1998.

On-Ice Seismic Operations in the Beaufort Sea, Alaska

On October 24, 1997, NMFS issued a proposed rule to renew the authorization for the incidental taking of a small number of ringed seals *(Phoca hispida)* and bearded

seals *(Erignathus barbatus)* incidental to winter seismic operations conducted by oil and gas exploration companies in the Beaufort Sea. Seismic surveys will be conducted using a Vibroseis energy source, wherein large trucks with vibrators mounted on them, systematically put variable frequency energy into the sea ice, underlying water, and bottom strata. Because a minimum of three to four feet of ice is required to safely support the weight of the equipment, on-ice seismic operations are usually confined to the five-month period between January through May. Seals are expected to avoid the immediate area around seismic operations, therefore, they are not expected to be subject to potential hearing damage from exposure to underwater sounds from the operations. Any takings of seals that occur are expected to result from short-term disturbance by noise and physical activity associated with the seismic operations. The effects of any such taking are anticipated to be negligible.

Regulations governing the taking of ringed and bearded seals incidental to on-ice seismic surveys will be published in early 1998 and will remain in effect until December 31, 2002. NMFS expects that Letters of Authorization to take the two species during these operations in the Beaufort Sea off Alaska will be issued soon after publication of the final rule to British Petroleum Exploration, Western Geophysical, and Northern Geophysical, all of Anchorage, Alaska.

Seabrook Power Plant Operations

On June 16, 1997, NMFS received an application for a small take exemption from the North Atlantic Energy Service Corporation to authorize the take of harbor seals *(Phoca vitulina)* and other pinnipeds incidental to routine operations of its Seabrook Station nuclear power plant. Seabrook is a single-unit, 1,150-megawatt nuclear power generating facility located in Seabrook, New Hampshire. Cooling water for plant operations is supplied by three intake structures approximately one mile offshore in 18 m (60 ft) of water. Approximately 1,782,200 L (469,000 gallons) per minute are drawn through the intakes to a 5.7 m (19 ft) diameter, 4.8 km (3 mi) long tunnel beneath the seafloor and into large holding bays (called forebays) at the power plant. Lethal takes of seals occur sporadically, and are expected to continue to occur as juvenile seals enter the cooling water intake structures and apparently drown en route to the forebays. A proposed rule to authorize the takings of these seals incidental to power plant operations and an accompanying environmentl assessment are expected to be published in mid-1998.

Small Takes by Incidental Harassment

Section 101(a)(5) of the MMPA was amended by the MMPA Amendments of 1994 to establish an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment only for up to one year (Incidental Harassment Authority). The amendments established specific time limits for processing applications, for public notice and comment, and for issuance or denial of authorizations. This type of authorization does not require issuance of regulations.

On April 10, 1996 (61 FR 15884), NMFS published an interim rule to amend the small take regulations to implement the process for issuing harassment authorizations without the need to issue specific regulations governing the taking of marine mammals for each and every activity. This rule sets forth the process for applying for and obtaining an authorization; the time limits set by the statute for NMFS review, publication, and public notice and comment on any applications for such authorizations; and the requirements for submitting plans of cooperation and for scientific peer review of an applicant's monitoring plans (if that activity may affect the availability of a species or stock of marine mammal taken by Alaska Natives for subsistence purposes). The rule also amended the regulations to clarify the requirements for obtaining a small take authorization and for requesting NMFS concurrence that no marine mammal takes are likely.

In 1997, under these new small take provisions, NMFS accepted applications on and issued authorizations for the following activities:

1) The taking of small numbers of seals and sea lions by harassment incidental to launches of Delta II, Lockheed-Martin Athena, Taurus and Titan rockets from Vandenberg Air Force Base (AFB), California. Prior authorizations for this activity had expired in 1995 and 1996.

2) British Petroleum Exploration Alaska (BPXA), Anchorage, Alaska was authorized to take small numbers of bowhead whales and four other species of marine mammals by harassment incidental to conducting a three-dimensional seismic energy exploration survey in the western Beaufort Sea, Alaska;

3) California Department of Transportation was authorized to harass harbor seals *(Phoca vitulina)* and California sea lions *(Zalophus californianus)*, while retrofitting the Richmond-San Rafael Bridge, San Francisco Bay, California;

4) ARCO Alaska was authorized to take small numbers of bowhead whales *(Balaena mysticetus)*, beluga whales *(Delphinapterus leucas)* and seals incidental to winter oil exploration in the Beaufort Sea; and

5) U.S. Geological Survey was authorized to take small numbers of marine mammals by harassment incidental to conducting a seismic survey for earthquake hazards in Puget Sound, Washington, in early 1998.

More detailed descriptions of these activities follow:

1) Vandenberg Air Force Base Launches of Delta, Lockheed, Taurus and Titan Rockets

During 1997, NMFS issued incidental harassment authorizations to the U.S. Air Force at Vandenberg AFB to take small numbers of harbor seals, California sea lions, elephant seals *(Mirounga angustirostris)*, and northern fur seals *(Callorhinus ursinus)* incidental to launches of Delta, Lockheed, Taurus, and Titan rockets at Vandenberg AFB, California. These authorizations, which are valid for one year, were issued on July 17, 1996 (Lockheed launch vehicles), November 13, 1996 (McDonnell Douglas Delta II), November 13, 1996 (Orbital Science's Taurus rocket) and November 27, 1996 (Titan II and IV rockets).

Based upon documentation submitted with these requests, NMFS concurred with the U.S. Air Force that the launches will result in only negligible impacts to harbor seals located on Vandenberg AFB, and no impacts are likely at the pinniped haul-outs on San Miguel Island, except for launches of Titan IV rockets with a trajectory that could produce a sonic boom over the northern Channel Islands. To ensure that these determinations are correct, the U.S. Air Force will conduct shore-based pinniped surveys along the Vandenberg coastline and will employ time-lapse photographic monitoring during any launch taking place during the harbor seal pupping season, when observers are denied access to the beach. Acoustic monitoring will also be employed whenever necessary at South Vandenberg and on San Miguel Island to obtain launch noise profiles. Biological monitoring at locations on the northern Channel Islands will take place whenever sonic booms greater than 0.9 kg/m^2 (2 lbs/ft^2) are predicted.

2) BPXA 3-D Seismic Survey in Beaufort Sea, Alaska

On March 5, 1997, NMFS received an application from BPXA requesting renewal of its 1996 authorization for the harassment of small numbers of several species of marine mammals, principally bowhead whales, incidental to conducting an ocean-bottom-cable-seismic survey during the open water season in the U.S. Beaufort Sea. The purpose of the survey was to refine assessments of petroleum reserves prior to developing those reserves.

The number of potential incidental takes by harassment will depend on the distribution and abundance of marine mammals (which vary annually due to variable ice conditions and other factors) in the area of seismic operations. In addition, no take by injury and/or death was anticipated, and the potential for temporary or permanent hearing impairment would be minimized through the incorporation of mitigation measures. This would include a shutdown protocol when marine mammals entered a predesignated safety zone, ramping up the source whenever it is powered down for more than one minute, requiring biological observers to monitor safety zones, and aerial and acoustic monitoring after September 1, 1997, to look for bowhead whales.

Because bowhead whales generally remain east of the seismic area in the Canadian Beaufort Sea until late August/early September, seismic activities were not expected to impact subsistence hunting of bowhead whales prior to that date. After September 1, 1997, BPXA initiated aerial survey flights for bowhead whale assessments. In addition, appropriate measures to avoid unmitigable adverse impacts on the availability of bowhead whales for subsistence needs were the subject of consultation between BPXA and subsistence users.

After a 30-day public comment period, which closed on May 22, 1997, and a review of both the documentation provided by the applicant and the views of the commenters, NMFS determined that the short-term impact of conducting seismic surveys in the Beaufort Sea would result, at worst, in a temporary modification in the behavior of bowhead whales and certain other species of cetaceans and pinnipeds. While behavioral modifications may be made by these species to avoid the noise associated with the seismic survey, but these behavioral changes are expected to have negligible impacts on the animals. Therefore, an incidental harassment authorization was issued to BPXA for a one-year period commencing on July 11, 1997.

3) California Department of Transportation Retrofitting the Richmond-San Rafael Bridge, San Francisco Bay, California

On July 7, 1997, NMFS received a request from the California Department of Transportation (CALTRANS) for an authorization to take small numbers of Pacific harbor seals and possibly California sea lions by harassment incidental to seismic retrofit construction of the Richmond-San Rafael Bridge, San Francisco Bay, California. The bridge will be seismically retrofitted to withstand possible future severe earthquakes. As construction in one area of the bridge may potentially result in disturbance of pinnipeds hauled out at Castro Rocks, an incidental harassment authorization under the MMPA was considered necessary. Taking of harbor seals and California sea lions could result from disturbance by the presence of workers, construction noise, and construction vessel traffic. Disturbance from these activities is expected to have only short-term, negligible impacts to a small number of harbor seals and sea lions. The potential for such disturbance will be reduced by implementation of proposed work restrictions and mitigation measures to avoid noise during the pupping season.

After public notice of the application and proposed authorization on September 3, 1997, and after consideration of public comments, NMFS determined that the short-term impact of the seismic retrofit construction of the Bridge will result, at worst, in the temporary modification in behavior by harbor seals and, possibly, by some California sea lions. Although behavioral modifications, including seals and sea lions temporarily vacating the haul-out site, may be made by these species to avoid visual and acoustic disturbance, the construction activities are expected to have a negligible impact on the animals. In addition, NMFS determined that no take by injury and/or death is likely, and harassment takes will be at the lowest level practicable due to incorporation of the mitigation measures mentioned above. Accordingly, on December 16, 1997, NMFS issued a one-year authorization to CALTRANS for these incidental takings.

4) ARCO Alaska Winter Oil Exploration

On May 15, 1997, ARCO Alaska requested a one-year authorization for the possible harassment of small numbers of several species of marine mammals incidental to moving a Concrete Island Drilling System (CIDS) from Prudhoe Bay to Camden Bay, Alaska, and drilling an oil exploration well at that location during the winter, 1997/1998. On July 15, 1997, NMFS published a notice of receipt of the application and proposed authorization. A 30-day public comment period was provided on the proposed authorization, and many comments were received. Due to the weather window, concern over impacts during the upcoming bowhead whale migration period, and other concerns, ARCO proceeded to move the CIDS prior to obtaining the incidental harassment authorization. A lawuit filed to stop the CIDS movement was unsuccessful and the movement was complete by August 18, 1997. The barging of fuel, equipment, and supplies was completed before the bowhead migration began; and ARCO negotiated a Cooperation and Avoidance Agreement with North Slope residents to avoid any unmitigable adverse impact on subsistence needs. After movement and supply, the CIDS was shutdown until ice conditions were satisfactory for drilling. After drilling, the CIDS went into cold weather shutdown.

NMFS determined that the short-term impact on marine mammals from the noise of this activity would result, at worst, in a temporary modification in the behavior of certain species of marine mammals. These behavioral changes are expected to have no more than a negligible impact on the animals and to have no unmitigable adverse impacts on their availability to Alaska Natives for subsistent hunting. Accordingly, on September 25, 1997, NMFS issued an Incidental Harassment Authorization to ARCO Alaska for the taking of small numbers of marine mammals incidental to conducting oil exploration activities during the 1997/98 winter in the Beaufort Sea.

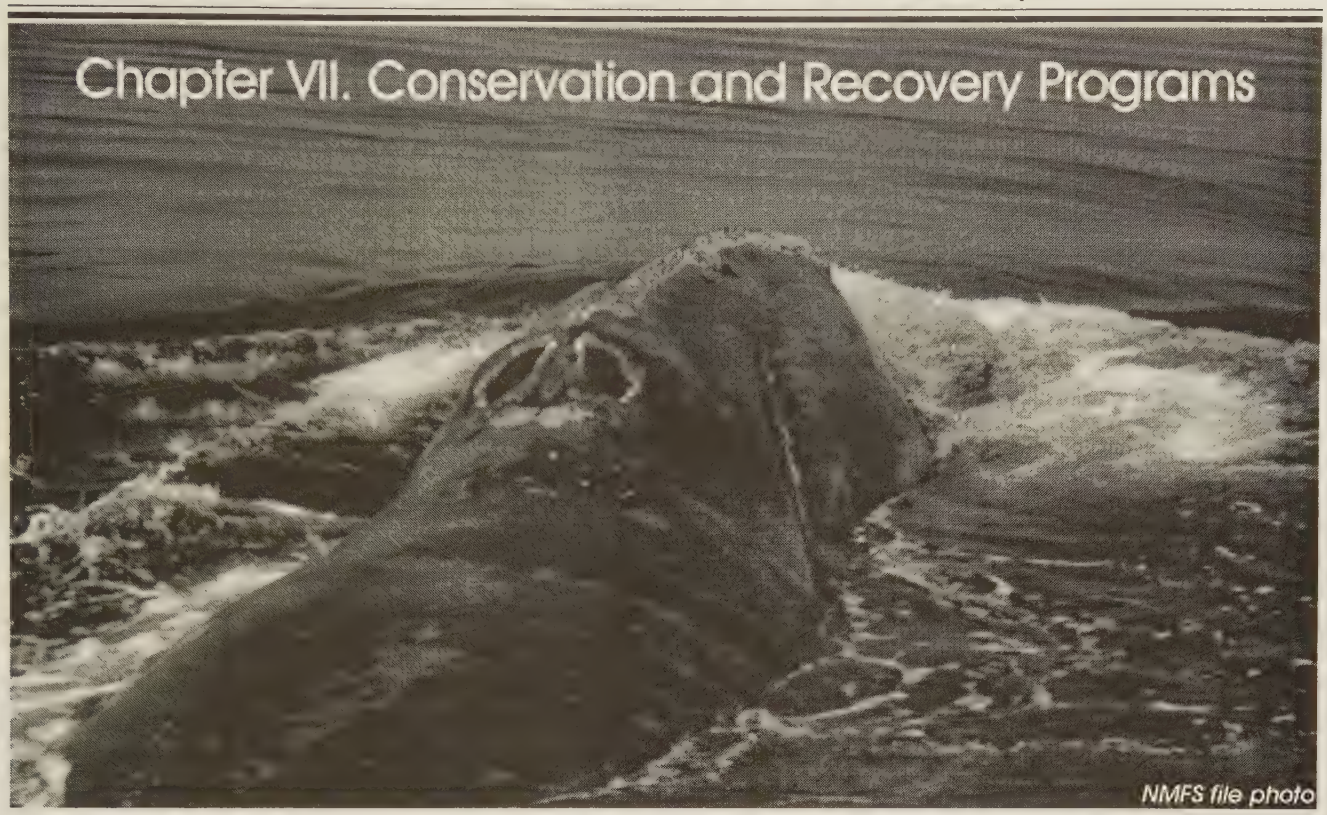
5) U.S. Geological Survey Conducting a Seismic Survey for Earthquake Hazards in Puget Sound, Washington

On December 30, 1997, after a public review and comment period ending October 18, 1997, NMFS issued an Incidental Harassment Authorization to the U.S. Geological Survey (USGS) for the harassment of small numbers of marine mammals incidental to conducting seismic surveys for research purposes in Puget Sound and the Strait of Juan de Fuca, Washington. The survey will be conducted in March 1998, to collect data on the earthquake hazards of the area.

Geological features lie obscured beneath water, city, forest, and thick glacial deposits. As a result, investigators must use sound waves that are produced by an array of air guns to indirectly view these features. Because seismic noise from the survey's air guns could potentially disturb marine mammals (i.e., acoustic harassment), an incidental harassment authorization was requested by USGS. Through its review, NMFS was able to determine that the short-term impact of conducting deep crustal marine seismic surveys would result in only a temporary modification in the behavior of certain species of pinnipeds and possibly, some individual cetaceans. Because these behavioral changes are expected to have no more than a negligible impact on the animals, the Incidental Harassment Authorization was issued.

The objectives of the monitoring program will be to minimize potential harassment of marine mammals by monitoring mandatory safety (shut-down) zones; to document the number of animals of each species present in the vicinity of the sound transmissions; and to evaluate the reactions of marine mammals to these transmissions. In addition to observers on board the seismic vessel, a Canadian ship and aerial surveys will be employed to assess impacts to marine mammals.

Chapter VII. Conservation and Recovery Programs


NMFS file photo

The Marine Mammal Protection Act of 1972 (MMPA) authorizes NMFS to initiate and implement management actions, such as the development of conservation plans, for species or stocks whose survival is in jeopardy. The Endangered Species Act (ESA) confers similar management authority to NMFS for endangered and threatened marine species. This chapter summarizes species management, as well as research activities undertaken by NMFS in 1997 pursuant to the MMPA and ESA.

Northern Right Whale (*Eubalaena glacialis*)

The northern right whale is the world's most endangered large whale species. In the North Atlantic Ocean, there are believed to be only about 300 individuals. North Atlantic right whales calve and nurse their young in winter off the Southeast United States in the waters of Georgia and Florida waters. In spring and summer, right whales feed off the Northeast of the United States' and Canadian coastlines. This species can be adversely affected by many human activities because of its coastal distribution. Like some other large whale species, northern right whales have been very slow to recover from over-exploitation by commercial whaling because of their slow reproductive rates and human-related mortalities. Over half of all western North Atlantic right whales bear scars from fishing gear of some type, and at least 20% of the mortalities documented between 1970 and 1989 were attributable to vessel strikes.

Between 1993 and 1997, there was an average of four to five documented right whale entanglements in U.S. waters per year, with some animals dragging the gear for weeks to months. Because of the large number of whales with fishing gear scars, this figure is considered the minimum when estimating the total number of entanglements. Recent mortalities off the Atlantic coast of the United States have caused escalating concern for the western North Atlantic population, especially with regard to the population's vulnerability to human interaction.

Given these threats to right whales, NMFS has intensely focused its efforts on reducing the likelihood of an adverse effect from human activities. To reduce the threat of vessel interactions (e.g., collisions and disturbance) with

right whales, NMFS has taken a number of interagency as well as international actions.

Because of the considerable amount of effort being put into the recovery of right whales and other endangered large whale species, NMFS augmented its staff at the Office of Protected Resources with the addition of a Large Whale Recovery Activities Coordinator in 1997. This individual will work with other federal agencies, members of the scientific community, as well as personnel within NMFS to coordinate recovery efforts for ESA-listed large whale species especially northern right whales.

The relative scarcity of current and historic sighting records from the eastern North Pacific suggests that this stock is very close to extinction. Historically, right whales occurred across the entire North Pacific north of 55° N. Scarce and geographically scattered sightings in the 20th century are from as far south as central Baja California and the Yellow Sea, and as far north as the Bering Sea and the Okhotsk Sea.

In the North Pacific, right whales were hunted from as early as the 1570s through 1980. The International Whaling Commission estimates that 15,451 right whales were taken by Japan in the North Pacific between 1840 and 1909. As a result, North Pacific right whales were rare by the end of the 19th century. Although this species has been legally protected in the North Pacific and throughout its entire range since 1949 under the Convention for the International Regulation of Whaling, it is now known that Soviet whalers continued harvesting North Pacific right whales until 1980. In addition, North Pacific right whales are likely subject to the same human activities that result in mortality and injury of North Atlantic right whales (e.g., fishing gear entanglement and ship strikes).

Increased search efforts and reporting of sightings to the appropriate investigators are resulting in a better idea of specific areas of occurrence and stock identity. Data to indicate trends in abundance are scarce, but the paucity of sightings strongly suggests there has been little or no growth in populations in either the North Pacific or North Atlantic. NMFS expects to support population abundance and trend assessment surveys of the populations in coming years.

Recovery Plan Research Efforts and Implementation

NMFS appointed a Recovery Team consisting of experts on right whales from the private sector, academia, and government. A Recovery Plan for the Northern Right Whale was approved by NMFS in December 1991. The Recovery Plan identifies known and potential factors affecting the northern right whale in both the Atlantic and Pacific Oceans, and it also recommends research and conservation activities to reduce or eliminate adverse effects to the species. The plan outlines the following objectives toward that goal:

- identify and protect habitats essential to survival and recovery;

- coordinate federal, state, international, and private efforts to implement recovery efforts;

- identify and minimize any detrimental effects of directed air and watercraft interactions;

- identify and/or eliminate sources of human-caused injury or mortality;

- maximize efforts to free entangled whales and acquire scientific information from all specimens, dead or alive; and

- monitor population size and trends in abundance.

For right whales in the North Pacific Ocean, the stated objectives are to:

- initiate studies to determine the population size and monitor trends in abundance;

- identify and protect habitats essential to survival and recovery;

- collect and analyze information on the areas and seasons where potential conflicts exist between vessel traffic and right whales and the type of vessels involved;

- vigorously enforce whale protection laws;

• continue international bans on hunting and other directed lethal take;

• reduce or eliminate injury and mortality caused by fisheries and fishing gear; and

• maximize efforts to acquire scientific information from dead or stranded right whales.

The Recovery Plan states that recovery is likely to be slow. Even under the best conditions, the northern right whale population will take more than 100 years to recover to pre-exploitation levels in both oceans. Therefore, as an interim goal, the plan seeks to work toward an increase in population such that right whales can be "downlisted" to threatened status. It recommends that this change in listing be considered when:

• the size of the western North Atlantic population recovers to a level of 6,000 individuals;

• the population has been increasing steadily over a period of 20 years or more at an average annual net recruitment rate of at least 2% per year; and

• an effective program is in place to control known right whale mortality factors and ensure that deterioration of essential habitat is not likely to occur so as to prevent the species' continued increase toward its optimum sustainable population level.

Updating the Recovery Plan

NMFS is updating the Northern Right Whale Recovery Plan. The updated plan will review progress made in implementing the 1991 plan, review information that has been gathered since publication of that plan, and identify new objectives and recommended recovery actions. Revised recovery actions will likely focus heavily on sources of human impact, specifically, ship strikes and entanglement. A proposed revised plan, expected by the end of 1998, will address both the North Atlantic and North Pacific right whale stocks.

Establishment of Regional Recovery Plan Implementation Teams

The ESA provides authority to the Secretary of Commerce to establish teams to review recovery activities and to, among other things, provide recommendations to NMFS on improving such activities. Two such teams have been formed for right whales – one in the southeastern United States and one in the northeastern United States.

Southeastern U.S. Implementation Team (SEIT)

In August 1993, the SEIT was formed. This team currently consists of representatives from the Georgia Department of Natural Resources; the Florida Department of Environmental Protection; NMFS Southeast Fisheries Center and Southeast Regional Office; U.S. Navy; Marine Mammal Commission; Georgia Ports Authority; Canaveral Port Authority; Glynn County Commission, Glynn County, GA; University of Georgia; U.S. Army Corps of Engineers; U.S. Environmental Protection Agency; Port of Fernandina, Fernandina, Florida; the U.S. Coast Guard (USCG), and the Jacksonville Port Authority.

Since its inception, the SEIT has met regularly and has been active in a number of areas, including the development of an "Early Warning System." This system involved aircraft surveys and communication systems to alert mariners to the seasonal presence of and real-time sighting data on right whales in the southeasten calving grounds. The central feature of the system has been a jointly-funded (NMFS, U.S. Army Corps of Engineers, USCG, and the U.S. Navy) aerial survey program designed to obtain accurate, current information on the locations of whales. On a number of occasions in recent years, aircraft observers were able to contact and divert a ship that was on a direct course for a right whale.

Surveys were initiated in the waters off the Southeast Region in fall 1993 and have been continued each year since. Survey lines are flown throughout right whale critical habitat, and in surrounding waters. Sighting locations are passed from the aircraft to centralized locations operated by the USCG and the Navy. These groups in turn relay the information through a number of real-

time media, including USCG Broadcast Notice to Mariners and NAVTEX (the USCG international communication system). If a survey locates whales, especially right whales within a specified distance of a navigational channel, vessels are advised to proceed at minimum safe operational speeds and keep a sharp lookout for whales. The U.S. Navy is the central repository and administrator of sighting location information. This system is continually reviewed and improved upon by the SEIT.

Members of the SEIT have also implemented a local Notice to Mariners broadcast about right whale calving grounds. This notice is broadcast four times daily by the USCG on VHF radio, and also is published daily along with the tides and weather in regional newspapers, and is carried by the Army Corp of Engineers as a part of its annually distributed tide charts. The SEIT also recommends to NMFS regarding right whale research in the Southeast United States and provides guidance on additional measures to reduce the possibility of ship strikes, including development of safe operating procedures for large vessels transiting right whale habitat, minimum vessel approach distances, and restrictions of hazardous fishing gear in right whale calving areas.

In recognition of their outstanding efforts on behalf of the right whale, members of the SEIT received a "Coastal America Partnership Award" in September 1997. The Coastal America Partnership recognizes federal agencies as well as state and local governments and other organizations that develop projects to protect, preserve, and restore coastal ecosystems while maintaining a health economic balance.

The Northeastern Implementation Team (NEIT)

Recovery Plan implementation for right whales and humpback whales *(Megaptera novaeangliae)* has been ongoing within NMFS Northeast Region since at least December 1990. These efforts were formalized with the establishment of the NEIT in August 1994. Team members include representatives from the USCG, the Environmental Protection Agency, NMFS, the Stellwagen Bank National Marine Sanctuary, the New England Fisheries Management Council, the Marine Mammal Commission, Canada's Department of Fisheries and Oceans, Massachusetts' Division of Fisheries and Wildlife, Coastal Zone Management Office, and Port Authority. Subgroups were formed to address research needs, reduction of mortality due to ship strikes and fishing activities, and habitat monitoring.

The NEIT has focused mostly on efforts to reduce human-related impacts to right whales. It provides recommendations to NMFS regarding ongoing plans for constructing a sewage outfall tunnel in Massachusetts Bay, dredge disposal activities in the Bay, restricting hazardous fishing gear in right whale habitats, advising fishermen regarding disentangling whales caught in gear, and issuing of permits for proposed aquaculture projects in Cape Cod Bay. The Team and its participating agencies have also had important roles in the "Early Warning System" aircraft survey and communication system, as well as in the recovery of stranded or dead floating whales.

Using the SEUS aircraft survey program as a model, efforts were initiated in 1997 to develop a similar program in Cape Cod Bay (CCB) and the Great South Channel (GSC) in late winter and early spring. The program is a cooperative effort by NMFS, the USCG, Massachusetts Division of Fisheries, the Massachusetts Environmental Trust, the Center for Coastal Studies, the U.S. Navy, and MASSPORT (the Boston port authority).

In 1997, surveys were conducted to cover peak right whale abundance periods and were flown principally between CCB in January and March, and in the GSC between April and early July. The 1997 surveys produced more than 300 right whale sightings. Sources of information for the early warning network include weekly survey flights by USCG helicopters, marine mammal lookouts posted during USCG vessel operations, and from USCG pilots, ship-based sightings by the Center for Coastal Studies during their studies of right whale feeding and behavior in CCB, or when responding to reports of whale entanglements, and sightings from research and other ships operated by the NMFS and the State of Massachusetts.

These sightings are reported to NMFS' Northeast Fisheries Science Center, where they are plotted via a Geographic Information System (GIS). They are disseminated

by an automated facsimile system to cooperators and made available to mariners through various media. Information is broadcast 24 hours a day to target shipping traffic as well as other marine resource users through established communication channels that include broadcast alerts on NOAA Weather Radio, the USCG broadcast Notice to Mariners, telex updates through NAVTEX, and the Army Corps of Engineers Traffic Controllers at Cape Cod Canal. Maps with right whale sightings are posted on the NMFS Northeast and Southeast Region web sites and at the WHALENET web site at:

whale.wheelock.edu/whalenet-stuff/reportsRW_NE/

A NMFS Inquiry (telephone) Line also provides information on sighting locations and sends information by facsimile to interested callers.

In addition to vessel strikes and entanglement in fishing gear, habitat degradation due to coastal development (e.g., discharge or disposal in the marine environment or fishery or mineral management activities), as well as disturbances by vessels such as noise pollution, have been identified as major threats to the right whale population. These impacts, among others, are considered to be major indirect threats. The precarious state of the right whale population and its preference for coastal areas strongly suggests that human activity may have a greater impact on population growth rates and trends relative to the other whale species.

NMFS Funded Recovery-Related Research and Activities

In addition to its management and monitoring program, NMFS is developing a three to five-year research plan that will focus on implementing those Recovery Plan priorities that address serious gaps in our present understanding of right whale biology.

NMFS has worked with several agencies and institutions toward implementation of the Northern Right Whale Recovery Plan. The USCG, The U.S. Navy, The Army Corps of Engineers, the Center for Coastal Studies, University of Rhode Island, the New England Aquarium, the Georgia Department of Natural Resources, and the Florida Department of Environmental Protection are among those who have already participated or will be participating in the following list of studies.

Maintenance of the Photo-identification Catalog and Associated Data

Photo-identification, along with associated sight-resight methods, has been identified as the best way to monitor trends in North Atlantic right whale abundance and life history parameters. Maintenance of the catalog and the ongoing analysis is central to a broad range of right whale science and management goals.

Stranding and Human Impacts Response

Life history and human impact data are obtained from stranded and dead floating right whales through collaboration between NMFS, the USCG, the Center for Coastal Studies, the New England Aquarium, and others. The on-site presence of experienced researchers is assured, as well as the maximization of data collection following standardized protocols and the submission of reports, which include the cause of injury or death.

Genetics

Genetic analyses have been underway since 1988 to determine or clarify information on taxonomy, matrilines, genealogies, and habitat-use patterns of right whales. These analyses are helping to provide insights into stock definition and genetic variability within a stock.

The goals of this research are to: assess the population's genetic heterogeneity (variability), identify the number of reproductive animals (the genetic-effective population size) and their reproductive status, identify social units and individual association patterns in each habitat area, better understand mating relationships, and identify matrilines, the degree of inbreeding, population viability, and other factors essential to management. Recent scientific investigations have compared the genetic variability of northern and southern (*E. australis*) right whales, and found the former to be significantly less diverse. This work suggests that this might be indicative of inbreeding in the population, but no definitive conclusion can be reached using current data. Another area with which ge-

netic analysis may be able to help is in searching for locations where individuals other than calving females and a few juveniles overwinter.

Radio Tracking

Radio tags are being used to identify the location of unknown wintering grounds as well as to gain better understanding of habitat use patterns in known high-use areas. Studies are ongoing in the Bay of Fundy in fall for unknown wintering grounds, and off the coasts of Georgia and Florida in winter and spring to track movements in relation to vessel traffic and document the spatial extent of the calving grounds.

Population and Abundance Studies of Right Whales in the North Pacific

The North Pacific right whale populations are presumed to be very small and are little understood. NMFS expects to support survey efforts in the coming years to assess abundance and trends in these populations.

Maintenance and Analysis of the Sighting Database in Waters of the Western North Atlantic

A long-term sighting and survey database is currently maintained, and newly collected information is added on a timely basis. Data products and analyses are provided to collaborating investigators. Priorities for this ongoing project in recent years include a review of distribution and demographics of right whales in New England waters and an analysis of estimated mortalities in relation to sighting effort.

Foraging and Habitat Use in Cape Cod and Massachusetts Bays

The goals of this project are to determine the physical and biological conditions linked with right whale occurrence and habitat-use patterns. Models of the bays' ecosystems will be merged with those of the GSC area to develop a composite characterization of preferred habitat.

Data Compilation and Review: Right Whales in New England Waters

This project's goals are to summarize, synthesize, and update information to provide a comprehensive picture of right whale occurrence in New England waters, and describe right whale distribution and habitat use. Central trends will be described as well as any anomalies and habitat shifts and movements or connections between sub-areas.

Population Modeling/Vital Rates

A series of demographic population models will be used to evaluate population status; determine vital rates most important in assessing abundance trends; describe the population's potential for growth; its expected fluctuations and its risk of extinction; and to provide guidance for population monitoring and other management activities. The models will also help to decide whether or not apparently unusual events should be considered natural fluctuations or evidence of worrisome changes in population performance.

NMFS Management Activities Under the MMPA

1998 Proposed List of Fisheries

NMFS is required by section 118 of the MMPA to annually publish the List of Fisheries (LOF), which classifies U.S. commercial fisheries into one of three categories based upon the level of marine mammal mortalities and serious injuries that occur incidental to those fisheries (see Chapter III. Reducing Interactions Between Marine Mammals and Commercial Fisheries). A notable change in the 1998 LOF was the combination of the New England inshore and offshore lobster pot fisheries into one fishery and the classification change of this fishery from Category III (remote likelihood of serious injury or mortality) to Category I (frequent serious injury or mortality). The re-classification was due to entanglement records that indicate that at least 0.2 right whales per year are seriously injured or killed incidental to the Atlantic lobster pot fishery. These events carry with them the ramifications of potential additional requirements,

e.g., observer coverage. Because of the current state of the northern right whale population, this level of impact is considered significant. This classification will continue in 1998.

Atlantic Large Whale Take Reduction Team and Plan

In August 1996, NMFS formed the Atlantic Large Whale Take Reduction Team to address the incidental take of humpback *(Megaptera novaeangliae)*, fin *(Balaenoptera physalus)*, minke *(Balaenoptera acutorostrata)* and northern right whales in the following fisheries: the Gulf of Maine/U.S. mid-Atlantic lobster trap/pot fishery, the mid-Atlantic coastal gillnet fishery, the southeastern U.S. Atlantic shark gillnet fishery, and the Gulf of Maine sink-gillnet fishery. The Team forwarded a non-consensus report to NMFS in February 1997. NMFS issued a proposed rule in April 1997 to implement a plan based primarily upon the recommendations within this report.

Following consideration of public comments on the plan, it will be implemented as an interim final rule, with most requirements taking effect January 1, 1998. The plan includes a number of measures to address right whale interactions in fishing gear. The proposed rule involved substantial reduction of some fishing operations and temporal and geographical restrictions of others. The plan contains regulations that focus on reducing the impact of fishing interactions on the most critical species, the right whale, by ensuring that gear regulated by this plan is either removed or significantly restricted in the three right whale critical habitats found in U.S. waters: Cape Cod Bay, Great South Channel, and the Georgia-Florida in the Southeast. However, the intent of the Atlantic Large Whale Take Reduction Plan (ALWTRP) is to achieve the long-term goals of the MMPA for all large whale species addressed by the Team through a combination of gear modifications supplemented by progressive gear research, expanded disentanglement efforts, extensive outreach efforts in key areas, and an expanded aircraft survey program. The basic elements of the proposed plan included:

1) a gear marking system to better determine the source of lines found on entangled whales;

2) the formation of a gear advisory group to identify and evaluate gear design features that would reduce entanglement risks for whales;

3) expanded support for whale disentanglement teams; and

4) a series of time/area closures and/or gear modification requirements; and

5) observer requirements and certain restrictions on the use of strikenet gear in otherwise closed areas. NMFS published an interim rule in July 1997. A final rule is being prepared that will likely be similar to the interim rule and is expected to be issued in mid-1998.

NMFS has also begun to implement other elements of the plan by:

1) establishing a fishing gear advisory group;

2) conducting research on potential fishing gear modification to determine ways to reduce entanglement and facilitate release following entanglement;

3) developing a fishermen outreach and education program;

4) expanding the disentanglement network;

5) hiring a large whale coordinator in Maine (a state in which much of the gear restrictions were opposed by the fishing community);

6) continuing and refining the Northeast aircraft survey program (EWS); and

7) implementing time/area closures, gear requirements, etc.

Atlantic Offshore Take Reduction Team and Plan

In May 1996, NMFS established the Atlantic Offshore Cetacean Take Reduction Team to address incidental take of several marine mammal species in offshore fisheries;

primarily the offshore driftnet fishery for swordfish, and the longline fishery for tunas. The Team submitted a draft Plan to NMFS in November 1996. Among other things, the Team proposed various measures to protect right whales that primarily involved restrictions or modifications of the drift gillnet fishery. In October 1997, NMFS released a draft environmental assessment of the proposed rule. Based in part on the Team's recommendations, the offshore drift gillnet fishery for swordfish, shark, and tuna was closed because of the potential for interaction with right whales. Rules further promulgating the Team's plan will probably be issued in 1998 or 1999. For additonal information about this and other take reduction teams, see Chapter III. Reducing Interactions Between Marine Mammals and Commercial Fisheries.

NMFS Management Activities Under the ESA

Proposal to the International Maritime Organization for Mandatory Ship Reporting

In late 1997, NOAA/NMFS, the USCG, and the Marine Mammal Commission began jointly developing a proposal for submission to the International Maritime Organization (IMO) requesting implementation of a mandatory ship reporting system in right whale habitats. The proposal would require all ships greater than 300 tons, entering essential right whale habitat (including designatied "critical habitat" and adjacent areas frequented by ship traffice and right whales) to report location, speed, and destination to a shore-based authority. Critical habitat is defined by the ESA in part as geographical areas containing physical or biological features essential to the conservation of a listed species (16 U.S.C. 1532). All reporting ships would receive in return a message describing the status, distribution, and behavior of right whales, along with additional information about ways to avoid colliding with whales. Information from reporting ships would be compiled in a database as well as in GIS format. Thus, the system would provide information on right whales directly to mariners as they entered right whale habitat and provide a means to obtain information on ship traffic volume and routes to assist in identifying measures to reduce future ship strikes. For example, the message going to ships will indicate that mariners should not assume that whales will avoid oncoming vessels and that lookouts be alert for right whales, that mariners should listen for broadcasts reporting recent right whale sighting locations, and advises that reduced speeds be used when near whales or traveling in critical habitats or during conditions of poor visibility.

To help convey NMFS' (NOAA's) message about the necessity to safeguard right whales from vessel strikes, an Information Paper was submitted by the U.S. through the USCG to the IMO describing the urgent need to protect right whales and NMFS' intent to submit a proposal for a mandatory ship reporting system. A related article appeared in the fall 1997 issue of the IMO Newsletter. The proposal is expected to establish a mandatory ship reporting system to be presented to the IMO's Subcommittee on Safety of Navigation in July 1998 in London. NMFS hopes that this plan will help bring the plight of the northern right whale to the forefront of the IMO's agenda.

While the system may not eliminate ship strikes, NMFS believes it will reduce the likelihood of such events. The proposed reporting system will be relatively inexpensive to implement and will raise mariners' awareness of right whales in "real-time" as they enter areas where right whales are found. It also will provide much-needed information on the frequency and distribution of vessel transits through right whale habitat.

Updating Nautical Charts and Coast Pilots

To help ensure safe navigation in coastal waters of the United States, the National Ocean Service (NOS) periodically publishes and updates nautical charts and a series of regional books called Coast Pilots, basic references on regional environmental conditions as well as navigation hazards and rules. In U.S. waters, all ship's captains are required to carry the Coast Pilots. Since late 1997, NMFS, NOS, and others have been working closely to update information printed on nautical charts and Coast Pilots regarding right whale critical habitat and regulations about approaching right whales and other protected marine species. Coast Pilots covering the entire eastern United States have been or will be updated to include

information on the status of right whales, the times and areas in which they occur, the threats posed to whales by ships, as well as advice on measures mariners might take to avoid hitting right whales.

In addition, related language regarding the vulnerability of right whales to ship strikes and guidance on how to avoid ship strikes has been included in the National Imagery and Mapping Agency's Notice to Mariners, which is updated and published annually. Efforts to ensure that these navigational aids are updated to include information on right whales has been a cooperative effort by the Northeast and the Southeast Implementation Teams, the International Fund for Animal Welfare, the Marine Mammal Commission, and NMFS.

The Safety of Life at Sea (SOLAS) Convention-driven International Safety Management Code requires vessel companies and owners to develop a procedure for safety of passengers and vessels at sea, which includes environmental protection measures and protocol. NMFS is working with the USCG to ensure that the implementing regulations include information regarding vessel operation that is consistent with protective measures for right whales and other protected marine species.

Disentanglement Response Program and Network

The Final Recovery Plan for the Northern Right Whale calls for establishing a disentanglement program for right whales. When whales become entangled in fishing gear, judgements must be made as to the efficacy and merits of disentanglement. Experience has shown that disentanglement is best undertaken by trained and experienced personnel, with appropriate protocols for the procedure as well as the associated data collection. Emergency response to marine mammal entanglements involves:

a) a multi-agency and institution network to locate, monitor, and safely disentangle marine mammals;

b) development and maintenance of a database for entanglements; providing data access and periodic reports to users ; and

c) development of regional protocols and plans, including outreach to the general public.

The current disentanglement effort consists of one primary team and field station support in the northern Gulf of Maine/Bay of Fundy, central Maine, southern Gulf of Maine, and Georgia/Florida. The northern Gulf of Maine/Bay of Fundy and Georgia/Florida field stations are operational primarily when biologists are conducting seasonal right whale research. The USCG provides critical support in monitoring initial entanglement reports and transporting disentanglement personnel to events. Although the disentanglement team attempts to respond to all legitimate entanglement reports, the priority for response is for any immediately life-threatening event of endangered right and humpback whales.

NMFS is working to expand the disentanglement network, particularly with respect to increasing fishermen involvement. Commercial fishermen, in many ways, would be ideal participants in the disentanglement network because of their vast experience on the water, knowledge of local fishing gear and practices, and familiarity with hazardous working conditions at sea. Fishermen are also likely to be operating vessels in areas where entanglements occur.

Because of this, NMFS asked the Center for Coastal Studies to develop a pilot program of formal large whale disentanglement training for commercial fishermen in the state of Maine. Maine fishermen were chosen as the first group to have the opportunity to receive this training because of their experience with the state's expansive coastline (approximately 8000 km or 5000 mi), which includes numerous islands and is otherwise difficult for NMFS to monitor.

Through cooperation between NMFS, the Atlantic Large Whale Take Reduction Team, lobster zone council representatives, other fisherman, and Maine outreach contacts, a pool of interested fishermen are being identified. This pilot program will consist of four training levels, which will increase the fishermen's level of involvement with the disentanglement procedures as they progress. Training is set to begin in March-April of 1998 (see Chapter XI. Public Education and Outreach Programs).

NMFS has also committed its support to expanding the Disentanglement Network to provide full-time coverage for the entire Gulf of Maine. This involves a permanent contact point in Maine to supplement the existing infrastructure operating out of the Center for Coastal Studies in Provincetown, Massachusetts. The Center for Coastal Studies and NMFS staff are initiating a coordinated plan for disentanglement response in the Southeast Region modeled after the existing one in the Northeast Region. NMFS anticipates that the fishermen training workshops conducted in Maine will be a good template for similar training in the SEUS and other key areas along the East Coast.

Cooperation with Stranding Networks

In cooperation with local and state participants, the NMFS' Southeast and Northeast Fisheries Science Centers coordinate the U.S. marine mammal stranding network, which responds to hundreds of strandings each year (see Chapter X. Marine Mammal Health and Stranding Response Program). Standardized protocols specific to large whale stranding events have been developed to help ensure that the best possible data are collected from each event. Because of the critical need for life history and human-impacts data on right whales and other species, and the limited opportunities to collect these data, information from stranded whales is essential.

Since 1991, the Northeast and Southeast Region stranding networks have responded to at least 15 right whale mortalities. More recently, there was one in Middletown, Rhode Island in 1995 and one in Wellfleet, Massachusetts in 1996. Large whale stranding data collected by the network participants are essential to understanding to what degree fishing gear or other sources of human-related mortality were responsible for an animal's injury or death. The protocol and forensic detail in which each stranding or entanglement event is investigated is standardized, thus increasing the management value of each individual report. NMFS maintains a database on all strandings and entanglements. Detailed investigations are now conducted on all entangled animals (live or dead) and summary reports are prepared that include: USCG and disentanglement team reports of the event, fishermen interviews, law enforcement investigation reports, stranding network reports and gear analysis by NMFS experts. These reports comprise NMFS' best description of the event and the involvement of fishing gear in the animal's injury or death. Any right whale found floating near or stranded on the coast is necropsied by an established team of experts to ensure we get maximum scientific value from each dead right whale.

Minimum Approach Rule for Right Whales

Disturbance to whales is identified in the Final Recovery Plan for the Northern Right Whale as among the principal human-induced factors impeding recovery of the northern right whale. Often where human activities coincide with right whales off the U.S. East Coast, there is potential for disturbance of right whales, alteration of their behavior, as well as injury or mortality. To minimize vessel disturbance of right whales, NMFS published regulations in February 1997 restricting vessel approach of right whales. These regulations prohibit all approaches within 460 m (500 yds) of any right whale, whether by boat, aircraft, or other means. These regulations are consistent with Massachusetts' approach regulations for right whales.

Section 7 Consultations

Section 7 of the Endangered Species Act (ESA) mandates that federal agencies ensure that any action they authorize, fund, or carry out is:

> *"not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species."*

Federal agencies comply with this requirement through an interagency consultation that involves NMFS, the U.S. Fish and Wildlife Service (FWS), or both, depending on the species affected by the action. Interagency consultations involve formalized procedures that are designed to identify the intended and unintended consequences of a federal agency's action; federal actions that are likely to adversely affect listed species or designated critical habitat undergo more rigorous evaluations that conclude with a "biological opinion." If the activity is likely to "jeopar-

dize", then a "jeopardy" decision is issued. If not, then a "non-jeopardy" decision is made. A considerable amount of the recovery activities for all endangered and threatened species are implemented through consultations between NMFS and other federal agencies. As a result of these consultations, NMFS issues a Biological Opinion (BO) on the activity, which indicates whether or not the activity is likely to jeopardize the continued existence of the species throughout all or a portion of its range and provides reasonable and prudent alternatives to the activity. The ESA also requires re-initiation of consultation if new information reveals that listed species or critical habitat may be affected in a manner, or to an extent, not previously considered.

This section summarizes the significant points of recent consultations on Naval operations, fishery management plans, and and USCG.

Consultation With the U.S. Navy

In 1996, six right whale deaths were documented in the western North Atlantic. Five of the carcasses were either recovered or reported in waters adjacent to the SEUS right whale critical habitat during calving season.

Navy facilities adjacent to the critical habitat use offshore areas for gunnery exercises, and because several of the carcasses were found near a Navy gunnery range, there was concern over the possibility that some deaths were related to recent Naval activities. Given the serious concern over the status of right whales, the Navy and NMFS began convening meetings on a near-continuous basis in mid-February 1996. By March 1996, the Navy initiated consultation with NMFS and began taking steps to alter its operations to minimize impact to right whales. These measures include:

a) instructing all Navy ships entering or leaving port to take the shortest route through right whale critical habitat;

b) altering most Navy ship operations to use moderate to slow speeds while in critical habitat;

c) providing special training in whale identification for lookout and bridge watch personnel and directing ship officers to stay well clear of whales;

d) committing to continued participation in regional early warning systems; and

e) moving gunnery and aircraft bombing training sessions at least 50 nm (92 km) from shore.

Although there was no direct evidence linking the right whale deaths to the Navy's activities, the Navy initiated consultation with NMFS in March 1996 on the potential impacts of their gunnery and air-dropped ordnance operations in waters off the SEUS. The purpose of this consultation was to ensure that the Navy was taking all appropriate measures to protect right whales, and to determine, if possible, the cause(s) of death of the whales. The scope of the consultation was expanded to include all Navy vessel and aircraft activities related to training in the consultation area. NMFS issued a "non-jeopardy" decision on the BO of Navy activities in May 1997.

Consultations on Fishery Management Plans

Over half of the identified right whales have scars indicative of entanglement in fishing gear. Gillnets and lobster gear are believed to be the primary gear types in U.S. commercial fisheries that entangle large whales. The following activities occurred in the last two years relative to fishing practices and large whale mortalities.

NMFS re-initiated ESA section 7 consultations on the Northeast Multispecies Fisheries Management Plan and the Lobster Fishery Management Plan. In part, this was done because of a letter sent by the Northeast Implementation Team regarding the Great South Channel (GSC) right whale critical habitat, asking that the area be closed during right whale migration periods. As advised by the Atlantic Large Whale Take Reduction Team, NMFS required the following reasonable and prudent alternatives:

1) prohibition of multispecies gear and lobster gear from April 1 through June 30, unless it is designed to eliminate entanglement;

2) coordination of similar restrictions in Cape Cod Bay (CCB) from February through May of each year; and

3) other provisions.

NMFS is exploring an option with the New England Fishery Management Council to implement the restrictions under the Magnuson-Stevens Fishery Management and Conservation Act (62 FR 15425-15428). If the Council does not approve this action, NMFS plans to work under MMPA and ESA emergency provisions. NMFS will also work with the fishers to modify gear to reduce the likelihood of entanglement and to facilitate disentanglement. NMFS is examining a dynamic management system in association with the Early Warning System, as well as alternative fishing practices that mitigate entanglement.

American Lobster Fishery. In December 1996, a BO was issued following a consultation on fishing conducted under the American Lobster Fishery Management Plan (FMP). The BO concluded that operations under the current FMP, including anticipated management actions over the next six months, were likely to jeopardize the continued existence of the northern right whale, but were not likely to jeopardize any other endangered or threatened species under NMFS jurisdiction. The reasonable and prudent alternatives identified in the opinion lead to the publication of an emergency regulation under the authority of the MMPA (62 FR 16108-16112) restricting the use of lobster pot gear in CCB critical habitat from April 1, 1997 to May 15, 1997, as well as in the GSC critical habitat from April 1, 1997 to June 30, 1997. These closures will remain in effect until gear modifications or alternative fishing practices are approved that minimize the risk of entanglement or reduce the likelihood that an entanglement will result in serious injury or mortality.

The BO also tasked NMFS with analyzing fishing effort in relation to whale distribution. NMFS' analysis, in coordination with the states, has begun to assess fishing effort, but models to predict shifts in effort have not yet been developed. This alternative is a long-term measure, which, in combination with the closures as short-term measures, and with an expanded disentanglement response network capability, brought the impact of the fishery to below the jeopardy threshold for right whales.

Under the Atlantic Coastal Cooperative Fishery Conservation and Management Act, NMFS is currently working with the Atlantic States Marine Fisheries Commission to develop a new management strategy for the lobster fishery. However, it is not known when this plan will become effective.

Northeast Multispecies Groundfish Fishery

Consultation was undertaken on fishing conducted under the Multispecies FMP. Like the Atlantic Lobster FMP BO, this BO concluded that actions under this FMP were likely to jeopardize the continued existence of the northern right whale, but were not likely to jeopardize any other endangered species under NMFS jurisdiction. The alternatives included short-term measures to prevent jeopardizing right whales, with long-term solutions expected later. As a result of the alternatives identified in the opinion, NMFS worked with the New England Fishery Management Council to develop regulations under the authority of the Magnuson-Stevens Fishery Management and Conservation Act (62 FR 15425-15428). The regulations closed federal waters to multispecies gillnet gear in parts of the following right whale critical habitat areas: CCB from March 27, 1997 to May 15, 1997, and from January 1 to May 15, in subsequent years; and the GSC from April 1 to June 30, annually.

Atlantic Pelagic Driftnet Fishery. The Atlantic Pelagic Fishery for swordfish, tuna, and shark was reviewed under an intra-agency consultation between NMFS' Offices of Sustainable Fisheries and Protected Resources to address the potential for right whale entanglement in gear used in these fisheries. The resulting BO concluded that continued operation of the driftnet component for swordfish, tuna, and shark was likely to jeopardize the continued existence of the right whale, primarily due to the southeastern Atlantic gillnet fishery for shark which occurs when right whales are present in SEUS right whale critical habitat. For example, one report potentially linking a right whale mortality to the shark driftnet fishery occurred off Florida in February of 1994. In addition, the marks on a freshly wounded right whale calf observed

off the coast of Florida during the same time-frame were consistent with gillnet gear, and the shark fishery was the only gillnet fishery operating in the area at the time. Therefore, one of the primary alternatives was closure of shark drift net operations in this area. In another incident, in July 1993, a right whale was observed entangled in a swordfish driftnet in the NEUS. This animal was entangled in lobster gear at the same time. However, the BO concluded that the probability of an interaction with this fishery in the offshore area, where the Northeast segment of this fishery generally operates, is remote since right whale occurrence in these areas is infrequent.

The BO recommended closure of the winter fishery for swordfish, tuna, and sharks to protect right whales. Other recommendations included educational workshops for fishermen, implementation of a limited access system, and 100% observer coverage (a single observed right whale take would close the fishery). This led to an emergency closure of the fishery from December 1996 to June 1997. The closure was subsequently extended for six months. NMFS issued an amended opinion in August 1997 to evaluate the impacts of this fishery on endangered and threatened species. This recommended closure of the mid-Atlantic (winter) fishery for swordfish, tuna, and shark. NMFS issued a rule extending the closure, under authority of the ESA, to August 1998. NMFS is considering further measures to limit this fishery.

Consultations with the U.S. Coast Guard

NMFS and the USCG have cooperated informally for many years on a range of marine protected species issues. For example, USCG ship and aircraft operators have provided reports of at least 12 "floaters" or dead whales since 1993. USCG vessels have also transported researchers and disentanglement teams to stranded and entangled whales, and USCG vessels and aircraft have been deployed to photo-document floaters at sea. The USCG has been an active participant in regional recovery plan implementation teams and has contributed to aircraft surveillance and sighting location communication systems.

On September 15, 1995, NMFS issued a BO on USCG Vessel and Aircraft Operations. On July 22, 1996, NMFS issued a second BO on these operations because of a suspected whale strike by a USCG vessel shortly after the first BO was issued. Those BO recommended ten major actions (as either reasonable and prudent alternatives or conservation recommendations) that the USCG could take to avoid the likelihood of its vessel operations jeopardizing the continued existence of the northern right whale. In compliance with the reasonable and prudent alternatives which, if enacted, would avoid the likelihood of jeopardizing the continued existence of the northern right whale, the USCG posts trained, dedicated lookouts on vessels, issues speed guidance for USCG vessels, issues approach guidance for USCG vessels, and provides information on threatened and endangered species to commercial and recreational vessel operators.

The following are significant measures put forth by both the 1995 and 1996 opinions, considered necessary to ensure that USCG vessel operations were not likely to jeopardize the north Atlantic right whale:

1) When and where possible, USCG vessels should avoid transiting right whale habitats and maintain minimum distances of 460 m (500 yd) from right whales.

2) All USCG vessels must post dedicated lookouts during all transits within 36.8 km (20 nm) of shore in addition to posting lookouts during transits in all right whale high-use areas.

3) All dedicated lookouts must have completed a standardized marine mammal training program as a part of USCG qualification criteria for bridge watch standers.

4) USCG will broadcast right whale sightings to advise mariners to operate at the slowest safe speed, exercise caution, and keep a watch for right whales.

5) From mid-December through March in the SEUS, broadcasts reporting right whale sightings should be transmitted as quickly as possible over all practicable means to as wide a distribution of vessels possible. The message should advise mariners within 27.5 km (15 nm) of the sighting to operate at the slowest safe speed, exercise caution, and keep a watch for right whales.

6) The USCG should continue its active participation in regional recovery plan implementation teams and provide support for aerial surveys during periods of high use in the different regions.

7) To avoid collisions with endangered whales, the USCG must provide information to commercial and recreational vessel operators (including publications commonly used by U.S. mariners for voyage planning purposes) with information on identifying whales, what the operator can do to avoid causing them harm, critical habitat and high-use areas, and regulations applicable to the protection of right whales. All vessel operators, including USCG, must be instructed to report all collisions or sightings of dead right whales immediately.

The USCG once again entered into consultation following the July 1997 strike of a humpback whale off New England. That consultation and preparation of a BO is underway and is expected to be issued in the summer of 1998.

Litigation

On June 7, 1994, Green World, an environmental activist organization, initiated litigation against the USCG alleging that their vessels had struck at least two northern right whales and that such "takings" of the whales and other USCG activities were illegal under Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), National Environmental Policy Act (NEPA), and the Whaling Convention Act.

On May 2, 1995, the court issued a memorandum and order, granting, in part, plaintiff's request for summary judgment. The court ordered the USCG to consult with NMFS under section 7 of the ESA, to apply to NMFS for an authorization under the MMPA, and to prepare an environmental assessment under NEPA. The court declined to issue a preliminary injunction. On September 15, 1995, NMFS issued a biological opinion evaluating the impact of Coast Guard operations along the Atlantic coast. On October 9, 1995, a USCG vessel struck another whale, believed to have been a humpback whale.

On June 19, 1996, the court granted plaintiff's motion to amend his original complaint, and an amended complaint was filed on June 21, 1996, adding the Fund for Animals as an additional plaintiff, officials in the Department of Commerce, NOAA, and NMFS as additional defendants, and a variety of new claims. The revised claims included allegations that the government failed to take steps to conserve right whales and other large whales, and in particular, failed to protect whales from vessel collisions and interactions with fishing gear.

At the hearing on June 19, 1996, the court also granted plaintiffs' discovery request, requiring the government to produce numerous documents and make certain witnesses available for depositions. In addition, the court indicated its interest in establishing a schedule for completing various administrative actions such as the issuance of another BO evaluating the impact of USCG operations on right whales, the classificiation of the lobster fishery under the MMPA, the creation of a Large Whale Take ReductionTeam, and the issuance of a proposed rule to restrict approaches to right whales. In response, the government filed a scheduling order and status report indicating its timetable for completing these actions.

On August 30, 1996, the plaintiffs filed a motion for preliminary injunction alleging that the government failed to promulgate a take reduction plan for large whales in a timely manner. The government opposed this motion and indicated that NMFS was committed to issuing this plan according to a specified schedule with the proposed plan to be issued by April 1, 1997, and the final plan to be issued by July 15, 1997. At the hearing on this motion, the court denied the request for preliminary injunction. In related litigation, the court issued a memorandum and order requiring the Commonwealth of Massachusetts to apply to NMFS for an incidental take permit and small take authorization, and to develop a proposal to eliminate or restrict the use of fixed fishing gear in Massachusetts' coastal waters designated as critical habitat for the northern right whale (Strahan v. Coxe, No. 95-10927-DPW).

The discovery phase of the litigation against the U.S. government ended in January 1997. Cross-motions for summary judgment were filed on March 7, 1997, re-

sponse briefs were filed on March 24, 1997, and reply briefs were filed on April 2, 1997. Oral argument was scheduled for May 7, 1997. On May 20, 1997, the judge assigned to the case issued an order and memorandum granting full summary judgment to the government. On November 3, 1997, the plaintiff appealed the decision to the U.S. Circuit Court for the First Circuit.

The original plaintiff was not represented by legal counsel in the original litigation against the USCG although the law firm of Foley, Hoag and Eliot represented original plaintiff and the Fund for Animals in the litigation resulting from the amended complaint. The law firm withdrew from the case following the judge's decision on May 20, 1997. The plaintiffs are representing themselves in the appeal litigation.

Steller Sea Lion *(Eumetopias jubatus)*

Steller sea lion distribution extends along the North Pacific Ocean rim from the Kuril Islands and Okhotsk Sea and south along the North American coast to California, with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands, respectively. Their numbers have been declining precipitously over the last 20 years. By the mid-1980s, it became clear that Steller sea lions were in serious trouble. As a result, the species was listed throughout its range as threatened pursuant to the ESA. Although specific causes of the decline remain unknown, possibilities include disease, environment perturbations (which may influence the quality and quantity of prey), fisheries impacts (including the indirect effect of reducing prey availability), or other causes.

Steller sea lion researchers and resource managers alike continue their efforts today to delineate causes for the decline and to determine effective management tools for their recovery. Currents progress toward these goals is discussed below.

Final Rule to Reclassify Steller Sea Lions Under the ESA

The Alaska population, that numbered close to 157,000 nonpups in the 1970s, declined to less than 69,100 nonpups by 1989, a decline of over 60%. Because of this precipitous decline in abundance, the species was listed as threatened throughout its range in 1990. NMFS determined, at the time of the listing, that there was insufficient information available to consider animals in different geographic regions as separate populations.

Available data on population trends indicate that the western population segment of Steller sea lions is in danger of extinction throughout all or a significant part of its range. This population had exhibited a precipitous, large population decline at the time that the Steller sea lion was listed as a threatened species in 1990 and has continued to decline since the listing. However, analysis subsequent to the original listing indicated that two distinct populations are represented within the different regions.

The eastern population segment has exhibited a relatively stable population trend for the last 15 years. However, the large decline of the overall U.S. population threatens the continued existence of the entire species. Since the 1990 listing, NMFS and the Alaska Department of Fish and Game (ADFG) have conducted monitoring surveys that indicate that the decline of Steller sea lions has continued throughout most of Alaska. However, NMFS believes that because the underlying causes of the decline remain unknown, they are largely unpredictable. Bases on this information, on May 5, 1997, NMFS published the final rule to reclassify Steller sea lions as two distinct population segments under the Endangered Species Act (ESA) (62 FR 24345), designating the western population (west of 144°W. long) as endangered and maintaining the eastern population (east of 144° W. long) as threatened.

Final Policy on Population Determinations

On February 7, 1996, NMFS and the U.S. Fish and Wildlife Service (FWS) published a policy clarifying its interpretation of the phrase "distinct population segment of any species of vertebrate fish or wildlife" for the purposes of listing, delisting, and reclassifying species under the ESA (61 FR 4722).

NMFS used the criteria in this policy to assess the presence of distinct population segments of Steller sea lions. The policy outlines the following three elements to be

considered in deciding the status of a possible distinct population segment as endangered or threatened under the ESA:

1) *discreteness* of the population segment in relation to the remainder of the species to which it belongs;

2) *significance* of the population segment to the species to which it belongs; and

3) population segment's conservation *status* in relation to the MMPA's standards for listing.

Discreteness: A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions: (a) it is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors (quantitative measures of genetic or morphological discontinuity may provide evidence of this separation); or (b) international governmental boundaries exist wherein significant differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms.

The former criterion is particularly relevant for Steller sea lions. Genetic studies provide strong evidence that discrete population segments of Steller sea lions exist. Tagging and branding studies provide further evidence that the breeding behavior of Steller sea lions probably limits opportunities for genetic mixing among rookeries, even though Steller sea lions have been documented to travel large distances during the non-breedings season. This apparent natal site fidelity not only reduces genetic mixing among rookeries, but also makes it less likely that declining rookeries will be bolstered by recruitment from other rookeries. Satellite telemetry studies also provide evidence of "homing" behavior in Steller sea lions. Studies have shown that, for the most part, sea lions forage from a central place (either near a rookery or haulout) and return to that place at the end of a foraging trip, which may vary in duration from hours to months.

Population trend data provide further evidence of separation into two population segments. The Steller sea lion numbers east of Cape Suckling (with the exception of the portion in southern California) have remained stable since the 1970s, whereas the numbers to the west have declined dramatically. It is also worth noting that the only break in the distribution of Steller sea lions along the Alaskan coast occurs in the Yakutat area, near the longitudinal border thought to delineate the western and eastern population segments.

Research findings also suggest that, based on an evaluation of distribution, population response, phenotypic, and genotypic data, Steller sea lions should be managed as two discrete populations, with the separation point at about 144° W. long.

Significance: If a population segment is considered discrete under one or more of the above conditions, its biological and ecological significance should then be considered independent of any others. In carrying out this examination, NMFS considered available scientific evidence of the discrete population segment's importance to the taxon to which it belongs. This consideration included, but was not limited to, the following:

a) persistence of the discrete population segment in an ecological setting unusual or unique for this taxon;

b) evidence that loss of the discrete population segment would result in a significant gap in the range of a taxon;

c) evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range; or

d) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

Because precise circumstances are likely to vary considerably from case to case, it is not possible to describe prospectively all the classes of information that might bear on the biological and ecological importance of a discrete population segment.

In the case of Steller sea lions, the eastern and western population segments (including those in Russian), make

up the entire range of the species. Extinction of either population segment would represent a substantial loss to the ecological and genetic diversity of the species as a whole. The importance of each of the population segments indicates that the significance criterion of the policy is satisfied.

Status: If a population segment is discrete and significant (i.e., it is a distinct population segment), its evaluation for endangered or threatened status will be based on the ESA definition of those terms and, primarily, a review of the factors enumerated in ESA section 4(a) for determining whether a species is endangered or threatened. These factors, as they apply to the western and eastern Steller sea lions population segments, were reviewed during the process by which the final determination was made for reclassifying Steller sea lions.

Recovery Team Efforts

The Steller Sea Lion Recovery Team developed a plan to review components of the Steller Sea Lion Recovery Program and rank future research priorities. In this regard, a series of workshops have been planned to examine four subject areas and are as follows:

1) behavior patterns at haulout sites and rookeries;
2) satellite telemetry;
3) physiology; and
4) food and feeding ecology.

Among other things, the workshops are intended to evaluate research hypotheses and methodologies, evaluate whether ongoing projects are likely to address proposed hypotheses, evaluate how ongoing studies complement one another, identify needs for coordination among related studies, and provide a basis for updating the Recovery Plan. The first two in the series were held in December 1997.

Research Activities in 1997

NMFS, the Alaska Department of Fish and Game, the North Pacific Universities Marine Mammal Research Consortium, and others have developed a cooperative research program to monitor population trends and elucidate the cause or causes of the Steller sea lion decline. International cooperative efforts, particularly with Russia and Japan, are also in place. For more information about some of these international programs, see Chapter XII. International Programs and Activities.

In 1997, Congress appropriated funding to the National Fish and Wildlife Foundation (NFWF) for Steller sea lion research at the Alaska SeaLife Center (ASLC) in Seward. This project is one in a series of projects awarded in 1997 through a cooperative process established by NOAA and NFWF in 1993.

In carrying out this directive, NFWF, in cooperation with NOAA and the ASLC, are in the process of identifying priority needs for ASLC conservation efforts regarding Steller sea lions. Correspondence amongst the cooperating entities began in December 1997.

Ongoing since the original listing of the Steller sea lion in 1990, NMFS and ADFG have conducted subadult/adult and pup surveys to routinely assess the Steller sea lion populations. Results of these population assessment surveys are published routinely as part of the NOAA Technical Memorandum series on Steller sea lion abundance estimates. In addition, the 1997 aerial and land-based survey results were presented to the North Pacific Fisheries Management Council in September 1997.

Section 7 Consultations under the ESA

With regard to proposed federal actions that may affect Steller sea lions, the ESA section 7 consultation process continues to be an important part of the NMFS Recovery Program.

Several consultations were addressed in Alaska regarding Steller sea lions in 1997:

1) NMFS has been consulting with the Federal Highway Administration regarding a proposed road from Juneau that could have serious impacts on a Steller sea lion haulout listed as critical habitat.

2) In December 1997, the North Pacific Fishery Management Council proposed a 60% increase in the 1998 total allowable catch (TAC) for the combined Western and Central Regulatory Areas of the Gulf of Alaska (GOA) based on a comparable increase in the biomass of

Figure 1. Counts of Adult and Juvenile Steller Sea Lions Observed at Rookery and Haulout Trend Sites in Seven Areas of Alaska During Aerial Surveys in June 1992, 1994, and 1996.

Area	Count			Percent change		
	1992	1994	1996	1992-94	1994-96	1992-96
SE Alaska	7,558	8,811	8,181	16.6	-7.2	0.8
Gulf of Alaska						
Eastern (PWS)	3,738	3,369	2,131	-9.9	-36.8	-42.9
Central	5,721	4,520	3,915	-21.0	-13.4	-31.6
Western	3,720	3,982	3,741	7.0	-6.1	0.5
Total GOA	13,179	11,871	9,782	-10.1	-17.6	-25.8
Aleutian Islands						
Eastern	4,839	4,421	4,714	-8.6	6.6	-2.6
Central	6,399	5,790	5,482	-9.5	-5.3	-14.3
Western	2,869	2,037	2,189	-29.0	7.5	-23.7
Total Aleutians	14,107	12,248	12,385	-13.2	1.1	-12.2
Alaska Total	34,844	32,930	30,348	-5.5	-7.8	-12.9
Kenai-Kiska	20,679	18,713	17,847	-9.5	-4.6	-13.7

groundfish. As a result of the proposal, which had not been considered in a previous biological opinion, NMFS reinitiated consultation, pursuant to the ESA, regarding the effects of the Fishery Management Plan for the Gulf of Alaska Groundfish Fishery and the effects of the 1998 TAC specifications upon the endangered western population of Steller sea lions.

After reviewing the best scientific and commercial information available on the current status of Steller sea lions and groundfish in Alaska, the environmental baseline for the action area, and the effects of the 1998 GOA fishery, NMFS concluded that the TAC increase is not likely to jeopardize the continued existence of the western population of Steller sea lions and is not likely to destroy or adversely modify designated critical habitat for the species in Alaska in 1998. NMFS Alaska Region intends to reinitiate ESA section 7 consultation for the fishery in 1999 and in the near future.

3) NMFS has begun consultation regarding a proposed Kodiak rocket launch site, which may have effects on a nearby Steller sea lion haulout; and

In the past, these federal agencies had not consulted with NMFS during land transfers, and thus, some critical habi-

Figure 2. Counts of live Steller sea lion pups observed at rookeries in Alaska during June-July 1991-1992, 1994 and 1996.

Area	Counts of live pups			Percent change		
	1992	1994	1996	1992-94	1994-96	1992-96
SE Alaska						
Forrester Complex	3,261	2,757	2,764	-15.5	0.3	-15.2
Hazy Island	808	862	768	6.7	-10.9	-4.9
White Sisters	95	151	182	58.9	20.5	91.5
Eastern GOA						
Seal Rocks	657	598	332	-9.0	-44.5	-49.5
Fish Island	514	305	232	-40.7	-23.9	-54.9
Central GOA						
Outer Island	180	119	114	-33.9	-4.2	-36.7
Marmot Island	1,611	804	632	-50.1	-21.4	-60.8
Western GOA						
Atkins Island	485	324	366	-33.2	13.0	-24.5
Eastern Aleutian I.						
Ugamak Island	813	574	706	-29.4	23.0	-13.2
Total	8,424	6,494	6,096	-22.9	-6.1	-27.6

tat sites for Steller sea lions passed out of federal jurisdiction without any consultation with NMFS.

Population Assessment

NMFS conducted an aerial survey on June 10-14, 1997 in the central and western Gulf of Alaska and the eastern Aleutian Islands. The 1997 survey included rookery and haulout sites from Outer Island off the Kenai Peninsula to the Umnak Island region. An Alaska-wide aerial survey for Steller sea lions was not scheduled for 1997 (since 1992, aerial surveys have been on an alternate-year schedule, see Figure 1, page 83). However, protocols and methods were the same as for previous June aerial surveys.

Numbers of nonpups at rookery and haulout trend sites in the above mentioned three-region area declined by 13.9% since 1994 (12,196 down to 10,505) and 10.3% since June 1996 (11,713 down to 10,505). The decline in the same regions from 1994 to 1996 was 4.0%. The greatest relative declines were in the central Gulf of Alaska (Kenai Peninsula to the Semidi Islands), a region where nonpup numbers have declined in each survey since 1989. Numbers also declined at trend sites in the western Gulf of Alaska and in the eastern Aleutian Islands. The decrease in numbers in the eastern Aleutian Islands from 1996 to 1997 (13.2%) was particularly notable because it came after a period of stability or slightly increasing numbers since 1990.

Considering all sites surveyed each year since 1994 (approximately 50% more animals than at trend sites only), the number of nonpups remained stable in the western Gulf and eastern Aleutian Islands (10,858 in 1994, 11,034 in 1996, 11,080 in 1997).

The most recent trend site counts/aerial surveys (using protocols similar to past summer surveys) conducted by NMFS and ADFG in the area from Southeast Alaska westward through Attu Island in the western Aleutian Islands took place in 1996. An overall decrease of 7.8% (from 32,930 to 30,348) since 1994 was observed in adult and juvenile numbers at trend sites in Alaska (see Figure 1, page 83). This was similar to the decline (5.5%) observed between 1992 and 1994.

Between 1994 and 1996, sea lion numbers have decreased in Southeast Alaska (7.2%, from 8,811 to 8,181 adult and juvenile animals) and in the Gulf of Alaska (17.6 % from 11,871 to 9,782), but not in the Aleutian Islands as a whole. The numbers went up 1.1%, from 12,248 to 12,385. Kenai-Kiska area trend site sea lion numbers decreased by 4.6% (from 18,713 to 17,847).

NMFS counted Steller sea lion pups at the following eight rookeries in the Aleutian Islands during June 24-July 7, 1997: Attu, Agattu (two rookeries), Buldir, Kasatochi, Seguam, Bogoslof, and Ugamak Islands. ADFG counted pups at the following three rookeries in Southeast Alaska during June 29-July 7: Forrester Island, Hazy Islands, and White Sisters. These were all beach counts (also called "drive" or "spook" counts), which required driving most nonpups from the rookery beach. NMFS and ADFG also made cliff counts of pups (viewing from overlooks with no disturbance to the animals) at three rookeries in the central and eastern Gulf of Alaska: Marmot Island (NMFS), Sugarloaf Island (ADFG), and Fish (Lewis) Island (ADFG).

The four rookeries on Attu, Agattu, and Buldir Islands in the western Aleutians had not been counted previously by NMFS, thus there are no comparable data for analysis. The most recent previous counts in the central Aleutians were in 1994. Pup numbers increased by 25 % at Kasatochi from 1994-1997, and a significance increase in pup numbers at Steller sea lions was not observed. Pup numbers at Bogoslof and Ugamak Islands were approximately stable from 1994/1995 to 1997, although the count at Ugamak in 1996 was greater by more than 100 pups. Numbers of pups at Forrester Island have been stable for several years. Numbers at the two other rookeries in Southeast Alaska, and for Southeast Alaska in general, continue to increase. Total pup numbers for the Southeast rookeries increased by 10% from 1994-1997 and 12% from 1996-1997.

Increases in pup numbers were documented at the western Gulf of Alaska trend site on Atkins Island (13.0% from 324 to 366) and at the eastern Aleutian site on Ugamak Island (23.0% from 574 to 706) between 1994 and 1996 as well. However, if one examines the percent changes in numbers within the range of the western Steller sea lion population (Gulf of Alaska, Aleutian Islands and Bering Sea) from 1992-96, there are clearly declines in all areas (see Figure 2, page 84). Pup production in the central Gulf of Alaska declined by 49% between 1991-92 and 1996. Pup production in the eastern and western Gulf of Alaska declined by 52% and approximately 25%, respectively, between 1992 and 1996.

California experienced a large decline in Steller sea lion numbers prior to 1980. In 1995, NMFS estimated a greater than 50% decline between about 1950 and 1980. Some of the available data indicate that a northward shift in the Steller sea lion range may be occurring, which may exacerbate the decline at southern rookeries. Steller sea lion counts in California have been relatively stable since 1980 (1980 count was 982), although counts declined 19% from 1990-94 (from 1,123 animals to 915).

Steller sea lion adult/juvenile counts at Oregon trend sites show a relatively large increase from 1990-94 (from 2,005 to 2,696). This may be at least partially due to improved counting techniques. Steller sea lion adult/juvenile counts in Southeast Alaska increased approximately 8% from 1992 to 1996 (from 7,558 to 8,181); however, pup counts decreased by about 10% (from a mean of 1,388 in 1992 to a mean of 1,238 in 1996).

Through a cooperative effort between NMFS, FWS, United States Geological Survey, University of Alaska, Fairbanks, and the Aleutians East Borough, scientists

conducted hydroacoustic-midwater trawl surveys for Steller sea lion prey at three sites in Alaskan waters during June/July 1996 and March 1997. The areas of operation included the Ugamak, Atkins, and Marmot rookeries and waters surrounding these sites. The principle objectives of these cruises were as follows:

1) to assess temporal and spatial differences in prey availability near Ugamak, Atkins, and Marmot Islands; and

2) to track instrumented juvenile sea lions while conducting hydroacoustics in tracking area.

A total of 527 km (316 mi) of transects were completed as part of the basic survey. Strong "echo sign" was rarely seen during the day, though distinct layers of zooplankton and fish were observed after 1:00 a.m.-2:00 a.m. Preliminary biomass estimates suggest that midwater biomass was greatest at Ugamak Island and declined to the east. Thirteen midwater tows were conducted to determine the species composition of the identified echo sign. One longline set was completed in rough bottom near each rookery to sample large fish and their prey. A sea lion "young-of-the-year" was successfully tracked, and it appeared to alternate between dive bouts of 10-15 minute in duration, and surface intervals of 5-10 minutes in duration when away from the haulout. Given the long periods of diving and the presence of prey in the area, it is probably reasonable to conclude the animal was actively foraging.

Physiological, Genetic, Survival, and Behavioral Studies

During June and July 1997, a total of 119 pups were captured and flipper tagged at five rookeries in the Aleutian Islands. Measurements of mass, standard length, axillary girth, and flipper width were obtained from each of these pups. Blood was drawn from 45 of the pups, and genetic samples were taken from 30.

Pups at Ugamak Island seemed generally lighter for the weighing date than previous years at that site. Pup weights at other sites were within normal ranges. Pups generally appeared normal and healthy, although four starving pups were observed at Ugamak (a site with 244 pups), which was a higher frequency than usual. Nine of the ten pups from which blood was drawn at this Ugamak site had not fed recently (this also occurred more often than in the past).

Efforts to Reassess Existing Protective Measures for Steller Sea Lions

In conjunction with the listing change, NMFS indicated that it was taking steps to reassess the effectiveness of existing protective measures. Given the current understanding of the sea lion/fishery prey interactions, additional research is warranted prior to establishing revised management actions.

Workshop on the Efficacy of Fishing Regulatory Zones

NMFS organized a workshop of outside experts to design an experiment for assessing the efficacy of closure zones to optimally benefit Steller sea lions without unnecessarily restricting commercial fishing fleets. An experimental design workshop was convened at the NMFS National Marine Mammal Laboratory (NMML), Alaska Fisheries Science Center (AFSC) in Seattle, Washington on May 6-7, 1997. The objectives of this workshop were: 1) to present to a panel of non-NMFS scientists, a review of Steller sea lion population dynamics and foraging ecology, an overview of current state and federal protective measures, and relevant fisheries; and 2) to request advice from this panel on experimental designs to test the efficacy of the no-trawl fishery exclusion zones, which were established around major Steller sea lion rookeries in Alaska in 1991-1993.

Presently, members of the NMFS staff at the ASFC are working on expanding the panel's recommendations and are developing specific experimental designs based on these recommendations. A draft plan is expected to be completed within the next several months. When that plan is available, NMFS will reconvene the panel to review and comment on the plan. It will then be distributed to interested parties in the scientific, fishing, and environmental communities, as well as to other governmental agencies, for information and comment. NMML's intention is to have an experimental design in place and to request funds that will allow work to begin in FY1999 or soon thereafter. NMFS continues to con-

sider other management options including restrictions on gear types, reductions in allowable catches, and modifications to temporal and spatial allocations. Additional research findings on Steller sea lions can be found in the annual reports of the Alaska Department of Fish and Game and the North Pacific Universities Marine Mammal Research Program.

Harbor Porpoise *(Phocoena phocoena)*

The range of the Gulf of Maine harbor porpoise extends from the Bay of Fundy, Canada, to the southern border of North Carolina. NMFS concluded that the New England, Mid-Atlantic, and Canadian gillnet fisheries incidentally take harbor porpoise at levels that are above the Potential Biological Removal (PBR) level for this stock (62 FR 3005, January 21, 1997). The best available information at the time of the proposed ESA listing indicated that the bycatch of harbor porpoise had to be reduced by more than 50% if the Gulf of Maine harbor porpoise stock was to be sustained. Despite fishery management measures enacted since 1994 to reduce interactions and incidental mortality, harbor porpoise bycatch rates have continued at a high level in the Gulf of Maine (GOM).

Harbor porpoise are especially vulnerable to capture in gillnets because of the animal's small size, and because harbor porpoise tend to feed in the same areas that are fished by the gillnet fleet. The true scope of this management dilemma is easily recognized when one considers that the average yearly take of harbor porpoise in commercial fisheries in U.S. waters from 1990 to 1995 is estimated to be 1,834 animals, and in 1996, the take was 1,511 from the New England and Mid-Atlantic gillnet fisheries alone.

This mortality rate exceeds the calculated PBR level for the GOM harbor porpoise, and scientists, managers, and the public have expressed concern that the stock may not be able to sustain the current overall highlevel of incidental bycatch in the Gulf of Maine and Mid-Atlantic sink gillnet fisheries.

Acoustic Deterrent Devices and Implications for Bycatch Reduction

Northeast Research

NMFS, the fishing community, and the NEFMC have been exploring the potential of mitigating incidental bycatch of harbor porpoises in gillnets by using active acoustic alarms. These devices have shown promise as a marine mammal bycatch reduction measure with varying success rates in both controlled scientific experimentation and experimental fisheries. However, scientists note that experimental results need to be viewed with caution when extrapolating to geographic areas or times of year other than those investigated within the experiment. Harbor porpoise may respond differently seasonally, between geographic areas, or with differing oceanographic conditions.

In the fall of 1994, NMFS authorized and provided support for a cooperative scientific experiment by New England gillnet fishers and scientists. Building on work completed in 1992 and 1993, the experiment sought to evaluate the effectiveness of acoustic deterrent devices attached to gillnets to prevent entanglement of harbor porpoise. The experiment was conducted in the "Mid-Coast" area off the New Hampshire/Massachusetts border closed to gillnet fishing. The experiment was designed with the recommendations of a NMFS scientific review panel. The experiment showed that pingers reduced the bycatch of harbor porpoise substantially during the fall in this area.

During the experimental fishery, 25 harbor porpoise were caught in 423 control nets, while only two harbor porpoise were caught in 421 active nets. The experiment resulted in similar catches of cod and pollock as well as seal damage was consistent between control and experimental strings. The pingers operated at an operational sound pressure level of 132 db (re 1 micropascal @ 1 m) and a primary frequency of 10 kHz, with harmonic effects extending into the 140 kHz range. Although the result was a dramatic reduction in harbor porpoise bycatch, some concerns remained after this experiment. It was uncertain why the alarms worked. Harbor porpoise may have responded directly to the sound or the

sound may have changed the behavior of harbor porpoise prey (herring). Other unanswered questions included whether or not harbor porpoises would habituate to pinger sound, the effects on other mammals and fishes, and the overall environmental effects of widespread pinger use.

As a result of the success of the scientific experiment, experimental fisheries (an experimental fishery is not a scientifically designed experiment, but a fishery in which pinger use is allowed under uncontrolled fishing conditions) occurred in the fall of both 1995 and 1996 and in spring, 1996. During the November/December 1995 fishery, when the only vessels operating were vessels using pingers, there were no takes of harbor porpoise in 225 nets (based on 48% observed trips) in the Mid-Coast area. In the fall 1996, three harbor porpoises were caught in 51 observed trips (198 hauls). However, the results of the spring 1996 experimental fishery were different. Eleven harbor porpoise were caught in nets with pingers. In the Jeffreys Ledge area nine harbor porpoise where caught in 88 hauls; in Massachusetts Bay two harbor porpoises were caught in 171 hauls; and in the Cape Cod South Closure Area no harbor porpoises were caught in 53 hauls. Catch rates in nets with pingers attached were similar to historic rates of bycatch from nets without pingers. However, the pingers may have been working up to the expectation of the 1994 scientific experiment, bu more porpoise could have been caught because of the higher numbers of porpoise in the fishing area. Thus, in spite of the absence of a control, it is hilghly likely that the pingers used during the experimental fishery in the spring of 1996 were as effective as the pingers used in the scientific experiment in fall of 1994.

One of the possible explanations for the high bycatch in Spring 1996 was that the earlier fall results may have been due to the pingers' deterrent effects on herring, which are not present in the region in spring. Consequently, the TRT recommended an additional scientific experiment in the spring of 1997. This experiment was conducted. The results from this experiment showed that there were similar mean fish catch rates and similar numbers of seals caught between all treatments. No harbor porpoise were caught in nets with active pingers, demonstrating that pingers reduced the incidental catch of harbor porpoises in sink gillnets during spring (close to 100%). Researchers have concluded that deterrent effects on herring do not explain the discrepancy between results of the fall and spring experimental fisheries. However, this did not yield any other explanations for the contradictory results of the spring 1996 experimental fishery.

NMFS recognized that unanswered questions add uncertainty to predictions of pinger effectiveness in areas other than those where the experiments occurred (in both time and area). As a result, NMFS recognized that conclusions cannot be drawn about the high bycatch observed in the spring 1996 experimental fishery, which lacked a control. Thus, management options concerning pingers should cautiously use the results of experimental fisheries. NMFS recognizes that sufficient monitoring of this fishery must occur during plan implementation to insure that the technology meets these expectations of effectiveness.

Assuming use of pingers is highly effective in all seasons and areas, a benefit of widespread use of pingers over long periods of time, as opposed to very short duration in limited closure areas, is that their use would account for seasonal and annual variability in abundance, distribution, and bycatch of harbor porpoise that has confounded the effectiveness of time-area fishing closures used to reduce bycatch levels. In the past, shifts in fishing effort to avoid closures has resulted in higher bycatch around the periphery of closures and minimal effects on overall bycatch levels.

NMFS conducted an Acoustic Deterrence Workshop in 1996 that noted,

"it is appropriate to proceed with the full-scale integration of pingers into the management regime for the NE sink gillnet fishery provided that the regime includes observer and monitoring programs adequate to verify that the bycatch remains acceptably low and that no non-target species is affected adversely."

A caveat was placed on this recommendation when the report was published noting that this conclusion may have been different had the results of the 1996 spring

experimental fishery been available or considered during the workshop. However, one hypothesis is that the discrepancy between results may have been in commercial use, suggesting that fishers may require training in order to ensure that the devices function properly. The devices themselves may also have been faulty. While this cannot be confirmed, fisher training in the care and maintenance of pingers will be addressed in the Take Reduction Plan through a mandatory certification requirement for fishers who want to use pingers.

Northwest Research

During 1995 and 1996 experimental field tests of pingers in the Spike Rock Makah tribal fishery in northern Washington demonstrated dramatic decreases in the incidental mortality of harbor porpoise. The experimental nets were alternately fished with and without pingers, which led researchers to question whether pingers in continual use would remain effective throughout the normal six to eight week fishing season or whether harbor porpoise would habituate and begin to ignore the acoustic barrier. One hundred fathom set gillnets were fished by the Makah. During the entire fishing season, each net was equipped with 11 pingers that were replaced as needed when the nets were checked.

NMFS observers stationed on a cliff overlooking the nets, systematically scanned the region around the northernmost net for harbor porpoise and recorded the position of any porpoise seen at the surface. With 88 net days (22 days with 4 nets), one harbor porpoise was entangled and with 92 net days, eleven porpoise were entangled. The probability that one or more porpoise entangled was significantly greater during the second half of the fishing season. However, the 1997 probability of entanglement for the entire season was not significantly different than for nets with pingers in 1995 and 1996. Although, the average distance between the observation net and harbor porpoise sightings decreased from the first to the second half of the study, the average distance prior to deployment of the pingers was not different than the first half-of the study and was different from the second-half of the study. This suggests that the increase in mortality in the second half of the study may have resulted from an increasing trend in porpoise using the area around the nets that was independent of pinger usage.

The results of the 1997 study are equivocal relative to harbor porpoise habituation to pingers; however, the study did demonstrate that with continual use of pingers for over six-weeks the porpoise entanglement rate (1 porpoise per 15 net days) was much lower than nets without pingers in 1995 and 1996 (1 porpoise per 2 net days). Pingers were not 100% effective, but clearly reduced entanglement in this fishery with historically high levels of porpoise mortality.

Takes of Harbor Porpoise in Canadian Waters

Gulf of Maine harbor porpoise are also caught incidental in gillnet fisheries in Canadian waters, and NMFS has a collegial relationship with the Canadian Department of Fisheries and Oceans (DFO). NMFS values the exchange of data and ideas that such a relationship affords. In the interest of continuing that relationship, NMFS will request that DFO consider the GOMTRT's recommendations. Canada has developed their own bycatch monitoring program and has authority to close fisheries for harbor porpoise conservation reasons. In recent years, controles on gillnet fishing effort in Canada have resulted in a decrease in harbor porpoise bycatch levels.

Harbor Seal
(Phoca vitulina)

In Alaska, harbor seals range throughout southern Alaska waters, the Gulf of Alaska, Aleutian Islands, and along the north side of the Alaska Peninsula and Bristol Bay (to about 59°N. lat). Prior to 1980, harbor seals were considered abundant in all parts of Alaska. However, surveys by ADFG researchers in the 1980s indicated sharply declining trends in some areas.

Correction Factor Study

The National Marine Mammal Laboratory (NMML) has conducted surveys in Alaska intermittently since 1976 and yearly since 1991 to obtain a minimum population estimate for the state. The State of Alaska was sub-divided into four regions for harbor seal census purposes in the early 1990s (these regions roughly follow the esti-

mated stock separations, but logistical considerations were the primary factor used for this delineation). NMML, with funding from the NMFS Office of Protected Resource's Marine Mammal Assessment Program, has sequentially censused each of these four regions since 1991.

Harbor seals are censused from aircraft by photographing those on land during the molt period (August/September). These surveys miss an unknown number of animals that are at sea during the survey period, and the number of animals hauled out is influenced by tidal state at many locations.

In 1996, NMML conducted the third year of a multi-year study to determine a correction factor for the relative proportion of seals that are at sea and thus are not counted during the surveys. This correction factor will be applied to count data to determine a more accurate estimate of harbor seal abundance in Alaska.

To determine the relative proportion of seals at sea that are not counted during low tide aerial surveys, NMFS researchers captured 34 harbor seals and equipped them with radio transmitters. Of these, 12 were males and 22 were females, comprised of 29 adults, three subadults, and two yearlings. Females showed a slight tendency to be further along than males in the stage of their molt. Aerial surveys were flown during the molt period in mid-August and early September to record the percentage of tagged seals hauled out. Most seals remained in Orca Inlet (near Cordova, Alaska), where they were tagged or nearby, within 4-6 km (2.4-3.6 mi). A few seals traveled to locations approximately 65-75 km (39-45 mi) away and returned. Eleven replicate aerial surveys were flown and the mean percent number of tagged seals hauled out each day was 53%. A correction factor of 1.90, the reciprocal of 53%, was computed (this correction should only be applied to those areas similar in geography and phenology and censussed during similar time periods).

Life History Parameters in Washington

In south Puget Sound, 55 seals were tagged and branded in October 1995, bringing the total of permanently marked seals in Puget Sound to 160. Sixty percent of these seals were resighted in the first year compared to 71% resighted from seals branded in 1994 and 85% resighted from seals branded in 1993.

In 1996, to investigate harbor seal life history parameters, NMFS researchers captured harbor seals at Gertrude Island in south Puget Sound and at Boundary Bay in north Puget Sound. Blood samples from 116 seals were screened for presence of Phocine Distemper Virus (PDV), leptospirosis, and brucellosis. An additional 25 samples from 1994 and 59 samples collected in 1995 were analyzed for a total of 200 samples from south Puget Sound. Results were negative for PDV and leptospirosis and brucellosis.

The total number of harbor seals and the number of pups were counted at four sites in south Puget Sound. During the pupping season, approximately 500 seals used Gertrude Island (including about 110 pups), approximately 100 seals used Eagle Island (including about ten pups), and approximately 400-500 seals used Woodard Bay (including more than 100 pups). No pups were observed at Commencement Bay which was used primarily by adult males and subadult seals. The first full-term pup was observed on Gertrude Island on July 2, 1996. Monthly mean counts at Gertrude Island varied from 194 to 548 seals, while numbers peaked during the pupping season and were lowest during the winter. Critical values of monthly mean counts were <0.1.

Abundance and Distribution in Alaska

1996 Survey

Minimum population estimates were obtained for harbor seals in the Gulf of Alaska regions along the south side of the Alaska Peninsula, Shumigan Island, Cook Inlet, Kenai Peninsula, and the Kodiak Archipelago during August and September 1996. The mean number of seals counted was 10,595 with a 95% confidence interval between 9,993 and 11,197. The coefficient of variation (CV) of the mean was equal to 2.9%. This represents an increase of 4,259 seals when compared to the mean count from similar surveys in 1992. Aerial survey conditions were exceptionally good in 1996, unlike 1992. At selected major sites (>100 seals) from all areas surveyed in both years, seal numbers at eleven of 20 sites increased

and seven decreased. The overall trend was positive. Approximately 846 more seals (18%) were counted in 1996 at these 20 sites. Seal counts between 1992 and 1996 were nearly identical in the fringe areas, but increased toward the center of the range, the Kodiak Archipelago. By far the largest increase occurred at Tugidak Island, which increased from 770 seals in 1992 and 1,345 in 1996. Seal counts at Tugidak Island, even though increasing, still represent an 80% decline over counts made in 1976.

1997 Survey

NMML scientists obtained minimum population estimates for harbor seals in the northern portion of Southeast Alaska in August 1997. The mean number of seals counted was 18,933, with the CV of the mean equal to 2.35%. Comparisons were made between similar surveys conducted in September of 1993. The 1993 surveys covered the entire Southeast Alaska region while the 1997 surveys only censused the portion from Kayak Island to Frederick Sound. More survey aircraft and observers were utilized in the 1997 study, and area coverage was much more complete. In 1997, one survey route was censused both in August and September with approximately 2,005 fewer seals (44%) being observed during the September survey. A site to site comparison was made for locations where there was a high degree of confidence that sites could be matched correctly. Observers more precisely delineated the location of sites in 1997 than in 1993 and recorded seals at 321 sites in 1997 and 139 sites in 1993. Roughly 10,000 more seals were recorded in 1997 than in 1993. Explanations for the increased number of seals observed may include: more complete area coverage, surveys conducted earlier when more seals are expected to haul out and weather is generally better, and the population growth is real and/or seals are immigrating from other areas.

Abundance in the Gulf of Maine

Harbor seals are year-round inhabitants of the coastal waters of eastern Canada and Maine and occur seasonally along the southern New England and New York coasts from September through late May. Scattered sightings and strandings have been recorded as far south as Florida. A general southward movement from the Bay of Fundy to southern New England occurs in autumn and early winter. A northward movement from southern New England to Maine and eastern Canada occurs prior to the pupping season, which takes place from mid-May through June along the Maine coastline.

Minimum abundance estimates were obtained for harbor seals along the Maine coast in May/June 1997. The number of seals counted was 30,990 between the Canadian/U.S. border and the Isle of Shoals off New Hampshire. This number is 7.6% higher than the count in 1993 (28,810). The annual rate of increase since 1993 has been 1.8%, as compared to 8.9% annual increase estimated for the period between 1981 and 1993. The estimate of the number of pups was 5,359 in Maine waters. The number of pups represented 17.3% of the population in 1997, which was higher than previous years.

There were 26% more pups on the coast of Maine in 1997 than in 1993 (4,250). Since 1981, the number of pups in Maine has increased at an annual rate of 12.9%.

Northern Fur Seal *(Callorhinus ursinus)*

Northern fur seals have been killed for their pelts at the Pribilof Islands since 1786. The kill became an enterprise of the United States government when it purchased Alaska, and was so lucrative that it alone repaid the purchase price in five years. International competition for pelts culminated in the International North Pacific Fur Seal Treaty of 1911 that involved Japan, Imperial Russia, Great Britain (for Canada), and the United States. All research and management of fur seals was conducted under the auspices of the North Pacific Fur Seal Commission from 1911 to 1985, except during World War II.

In the 1950s, managers noted that the number of pups being born annually was the same as in the herd's most productive period (1932-37), but that far fewer juvenile males were available to kill for pelts. They surmised that density-dependent mortality was increasing juvenile mortality, and that this situation could be reversed by reducing the number of pups being born annually, thereby reducing competition for food that was believed to be

causing the reduced survival. Consequently, managers killed 331,000 females from 1956-63 in what was called the herd reduction program. Managers expected the herd to recover from this reduction at 8% per year. Nine years after herd reduction ended, the expected recovery had not yet begun, and the herd continued to decline, ironically, at 8% per year.

Believing that it did not fully understand the relationship between survival and abundance, or the effects of human activities on seal behavior and ecology, the United States proposed that all fur seal rookeries on St. George Island be set aside as a research preserve for 15 years to permit comparisons with rookeries at St. Paul Island (40 km or 25 mi away) where the kill for pelts was to continue. Investigations were to include behavior, ecology, population dynamics, and pelagic studies. The behavioral project was to investigate whether behavioral changes had occurred as a result of artificial selection, human disturbance, or density-dependent processes on breeding areas. Behavioral studies were also to investigate the effects of fur seals on the fishery for walleye pollock. Behavioral studies began collecting data in the summer of 1974. The St. George Island project officially ended in 1985 when the United States failed to approve continuation of the treaty. However, field work in behavior continued until 1992 when data analysis began.

Research Efforts

Objectives of National Marine Mammal Laboratory northern fur seal research in 1997 included monitoring population status and trends, monitoring entanglement rates, and investigating foraging ecology and movement patterns at sea. Population monitoring activities, such as adult male counts, pup censuses, pup mortality, and pup condition indices provide vital rates with which northern fur seal population status and trends are monitored. Entanglement studies provide additional insight into mortality and survival rates, particularly for juvenile males, and enable NMFS to make an assessment of the effects of mitigating measures. Female foraging studies, scat analysis, stable isotope analysis, and pup migration studies provide information on prey species, feeding areas, and migration routes, which aid in understanding foraging ecology and movements patterns at sea.

Researchers are currently analyzing these data. Preliminary results of some population monitoring activities for 1997 are briefly discussed here. When completed, these results will be presented as a collection of research papers in the annual NOAA Fur Seal Investigations Technical Memorandum Series.

On Bogoslof Island in the eastern Aleutian Islands, the number of pups born in 1997 was 5,096 (SE=32.7). This estimate represents a 300% increase in the number of pups born over the 1995 count. This dramatic increase must be due to immigration as it far exceeds the species maximum reproduction rate. The number of nonpup northern fur seals counted on Bogoslof Island in 1997 was 13,451 (SE=541.5). This represents a 273% increase over the 1994 count of 3,691. Adding the non-pup count to the estimate of pup production yielded a total Bogoslof Island population size of 18,847 (SE=542.5).

Studies of the life history parameters of northern fur seals were continued at San Miguel Island toff southern California throughout June, July, and August 1997. The primary objectives of these long-term studies, conducted in cooperation with the Channel Islands National Sanctuary Program and the National Park Service are: 1) to estimate survival, recruitment, and natality of the species as part of a comprehensive assessment of the ecology of pinnipeds in the Channel Islands and 2) to assess the status and recovery of fur seals throughout the North Pacific Ocean in accordance with the Fur Seal Conservation Plan. The total observed pup production at the San Miguel Island rookery complex was 3,124. The highest number of territorial males counted was 250 (142 with females, 108 without females), up 34% from 1996.

On St. Paul Island in the Southeast Bering Sea, 5,064 territorial males with females, and 8,560 idle adult male fur seals were counted in 1997. On St. George Island, 910 territorial males with females, and 1,474 idle adult male fur seals were counted in 1997. From 1996 to 1997, the counts of territorial males with females decreased 10.3% on St. Paul Island and 27.1% on St. George Island. The total number of adult males on the Pribilof Islands decreased by 5.4% from 1996 to 1997.

During the 1997 northern fur seal pup mortality studies, 165 pups were necropsied on St. Paul Island. Emaciation was the primary cause of death and was observed in 70% of the pups necropsied (the highest percentage observed during twelve years of pup mortality studies).

Condition Indices of Pups on St. Paul and St George Islands

Pup measurements conducted during 1997 on the Pribilof Islands found significant differences in size between males and females, as well as between islands. Male pups weighed more and were longer than female pups. Weights and lengths were greater on St. George Island than on St. Paul Island, for both male pups ($P=0.021$, $P<0.001$) and female pups ($P<0.001$, $P<0.001$). The proportion of females observed during pup measurements was not significantly different than 50% for both islands in 1997 (48.5% on St. Paul Island and 48.8% on St. George Island).

Entanglement Studies: St. Paul and St. George Islands

In 1997, in cooperation with the St. Paul and St. George Islands' Tribal Councils and the Pribilof Islands Stewardship Program, NMFS continued a study of juvenile and adult male fur seal entanglement in marine debris. This study was initiated in 1995 using a combination of research roundups and surveys during the Aleut subsistence harvest to try and determine a possible cause for a decline in numbers. Surveys are conducted in conjunction with the subsistence harvests to reduce the number of times seals are disturbed.

The objective of this study was to determine current trends in the rate of observed on-land entanglement of northern fur seals in marine debris on St. Paul and St. George Islands. This information is being collected in order to provide:

1) a continuing index of entanglement rates;

2) a comparison of entanglement rates on St. Paul (which has been relatively stable since 1980) and St. George (which has been decreasing) Islands;

3) a means of indirectly assessing the relative amount of entangling debris within the habitat of the fur seal; and

4) an assessment of the proportion of debris types associated with different fisheries that are impacting fur seals.

The juvenile entanglement rates in 1997 were 0.19% on St. Paul Island and 0.23% on St. George Island. The 1997 rate of entanglement on each island was similar to the rates observed in 1996.

During entanglement studies in 1997 on St. Paul and St. George Islands, a total of 62 entangled northern fur seals on non-rookery haulouts were captured and debris removed from their bodies. An additional 43 entangled fur seals were opportunistically captured and disentangled during other research projects. Four individual seals, all juvenile males, were disentangled on St. George Island. On St. Paul Island, 22 fur seals were disentangled during other operations, including 12 juvenile males and ten males five or more years old. On Bogoslof Island, 17 individual seals were disentangled during other research projects, including 15 juvenile males and two young females.

The St. George Island Project

The St. George Island Project was an integrated research program on northern fur seals in the Pribilof Islands, Alaska, from 1973 to 1988 that was intended to answer fundamental questions about the behavior, ecology, and population dynamics of the species. Most of the work was conducted by the National Marine Mammal Laboratory in Seattle. The final report of the behavioral portion of the program will be published in early 1998. Many of the results answer specific questions posed by the St. George Island planning document.

Behavioral Studies Component. The behavioral project collected descriptive data on many aspects of fur seal behavior at two study sites on St. George Island for three years as a baseline against which to compare future changes. The sex ratio was expected to change because juvenile males (which were the only age and sex class allowed to be harvested) were no longer to be killed for their pelts, and herd size was expected to increase be-

cause of more efficient reproduction. After a hiatus of eight years the baseline measures were repeated so that behavior could be compared at a different herd size and sex ratio. The study focused on the behavior of several thousand marked individuals. During the same time, the project conducted behavioral experiments that were fundamental to the fur seal mating system and maternal strategy. It also investigated foraging ecology using time depth recorders (TDRs), and it compared foraging at the Pribilof Islands with foraging at Medny Island, Russia, in 1990. The behavioral project operated separately from the population dynamics and pelagic projects and included none of those results in its final report.

General Results. The behavioral project answered most of the questions posed by the program outline. It was particularly successful in documenting the pelagic activities of fur seals. Through a contractor, the behavioral project produced the first TDR, an instrument that could document all the foraging dives that females make on a trip to sea. TDRs are now a standard tool for investigating foraging ecology in marine mammal research.

Contrary to predictions, the northern fur seal population on St. George Island continued to decline after the killing of males stopped in 1972 (it fell by 93% and 80% at the two study sites). The St. George population continued to declined until 1997, when it may have increased slightly. The decline stopped at St. Paul Island in 1981.

At St. George Island the sex ratio declined as predicted, falling from more than 25 to about nine females per breeding male. Nine to one may be the species optimal sex ratio given that this ratio remained unchanged for nine years despite the overall decline in numbers.

During the years of decline, the density of females within groups on shore remained the same. This is a very important finding because it implies that the density of breeding groups is independent of population size and sex ratio. Since animals experience the same density of neighbors regardless of total population size, the behavior they display on shore does not depend on the overall size of the population. Any contribution that behavior makes to density-dependent mortality it is likely to occur at sea and not on land.

The results show that fur seal harvests cannot have caused the population declines at the Pribilof Islands from 1956 onward. The St. George Island population continued to decline for at least 24 years after the kill there ended, and the St. Paul Island population stopped declining four years before the commercial harvest ended there. That is, population trends were independent of the presence or absence of a kill for pelts.

Environmental changes seemed to have no effect on the timing of reproductive events. The female population peaked during the same week of the year, and the median arrival date of the population did not change for 15 years despite a major El Niño event, and a change in the North Pacific climate regime. Timing of reproduction appears to be driven by the light cycle, rather than proximate environmental events. An exception to this may be in the event of extreme environmental perturbation such as that observed in 1997 and again in 1998 in the Bering Sea. In which case, females may return to St. George Island only briefly to breed, or not at all. This data is currently being analyzed.

Activity cycles on land did not change with population size or sex ratio, and are not likely to have been affected by human activities on breeding and landing beaches. Activity cycles on land are similar to those at sea (as measured by TDRs). The most likely explanation of this finding is that fur seal activity cycles are driven by the nightly shift of fur seal prey into surface waters. Those at sea feed at night, and those on shore (28 and 40 days per year for females and males respectively) are active doing most of their mating then.

For many behavioral traits, individuals had much narrower, more specific behavioral tendencies than the population as a whole. For example, the female population arrived over a six-week period, but individuals usually arrived on about the same date each year. Mating occurred in the population over a six-week period, but individual females mated within an eight-day period unique to her. As long as the population remained stable, many females bore young within 8.3 m (27 ft) of the same site (unique for each female) from year-to-year despite the fact that many square kilometers were available to the population for pupping. Males returned to the same

territorial boundaries year after year although many square kilometers of space were available to them. Population models do not include these specific tendencies of individuals and therefore, when viewed alone, tend to mispredict how the herd will act when it changes in size or sex ratio.

Experiments on captive fur seals disclosed some previously unknown facts about estrus in this species. These results showed that most females mate only once per year. If the female fails to mate, estrus wanes after only 34 hours and does not recur later that year. Given that more than 90% of some age classes are pregnant each year, it is evident that mating is usually a highly efficient process. One factor that makes it so efficient is the presence of the male which apparently induces the onset of estrus in females. This factor, known as the Whitten Effect, has not previously been reported in pinnipeds.

One reason the population may have failed to recover from the 1956-63 herd reduction program is that the climate regime that existed at that time was noted for low marine productivity. It is possible that under those foraging conditions juveniles had lower survival than in the 1930s, and did not recruit into the adult population in numbers that would allow the herd to recover from artificial reduction.

The aspects of diving that relate to environmental factors (such as day length and depth of prey) change seasonally, but those that relate to physiological capabilities of individuals (such as recovery from diving) do not. Local foraging conditions, such as the width of the continental shelf, are the major cause of differences in foraging behavior at different islands in the range.

Experts have not yet agreed on the combination of factors that caused the fur seal declines from 1956 onward, although many single, separate causes (such as entanglement) have been proposed. The main lesson from the St. George Island Program is that too little is yet known about environmental changes, marine mammal trophic relationships, and human effects on both to confidently predict the recovery rate of a reduced seal population.

Hawaiian Monk Seal *(Monachus schauinslandi)*

The Hawaiian monk seal is endemic to the Hawaiian Archipelago and is the only endangered marine mammal located entirely within U.S. waters. The species was listed as endangered after a 50% decline in beach counts occurred between the late 1950s to the 1970s. Studies conducted over the past decade indicate that population abundance has continued to decline at 4-5 % per year. In the last three to five years, beach counts have stabilized, but further overall declines are likely due to high juvenile mortality and an expected decline in recruitment. In 1997, total abundance was estimated at about 1300-1400 seals.

Studies of the Hawaiian monk seal are conducted primarily by members of the Marine Mammal Research Program of the NMFS Honolulu Laboratory. The studies' purposes are to provide up-to-date information on the status and trends of each of the six main reproductive subpopulations of seals. Information is collected annually on abundance, composition, survival and reproductive rates, growth and condition of seals, evidence of disease, behavior, movement between sites, fisheries interactions (including entanglement in marine debris), foraging ecology, and the effectiveness of management programs aimed at facilitating recovery.

Recovery Team Activities

The Hawaiian Monk Seal Recovery Team held its annual meeting at NMFS Honolulu Laboratory on December 1-3, 1997. The focus of the Recovery Team meeting was to assist the NMFS Southwest Region with prioritization of research and recovery actions that have the highest potential of directly benefitting the species. The objectives are updated every three years and used to prioritize future research and recovery activities. During the HMSRT meetings, the Marine Mammal Research/ Monk Seal Program staff presented a review of their field studies. These studies (discussed in greater detail below) provide information necessary to evaluate key objectives that have been identified by the HMSRT:

1) the status and trends of monk seal populations;

2) survival, reproduction, growth, behavior, and feeding habits; and

3) the results of various activities designed to facilitate population growth and reduce human disturbance.

Foraging Ecology

For the past decade, the study and management of the Hawaiian monk seal has been based largely on information collected on land. A clear understanding of the marine distribution and behavior of these seals has been limited by an inability to study them at sea. The lack of information about their foraging ecology has been a particular impediment to their management. Relatively little is known about the distribution of seals at sea, their foraging behavior and strategies, and their preferred prey. Thus, scientists and managers have been handicapped in their ability to predict or assess the possible consequences of direct or indirect fisheries interactions. Also, while researchers attribute the severe increase in juvenile mortality since 1989 to starvation, the feeding habits or patterns of young seals cannot be accurately described.

In recent years, technological advances have enabled the study of seals at sea. Foraging distributions are currently being evaluated by NMFS, in collaboration with the University of Minnesota, the National Geographic Society, and Hubbs-Sea World Research Institute, using satellite-linked telemetry (both ARGOS and Global Positioning System technologies), as well as underwater video systems that allow observation of feeding and other behaviors. While monk seals were previously thought to remain near their haulout locations, they are now known to travel to distant banks up to approximately 240 km (144 mi) from their haulout sites in the Northwestern Hawaiian Islands. Further, seals were thought to feed primarily on reef fishes throughout the water column, but video data indicates that they focus primarily on benthic organisms (at least during days when underwater video documented foraging patterns). The seals in these and other studies fed primarily at depths less than 100 m (110 yd), but some seals foraged at depths greater than 500 m (550 yd).

A complete assessment of the foraging ecology of the Hawaiian monk seal will take extensive effort over many years. Nevertheless, important progress was made in 1996 and 1997, through satellite-linked studies of distribution and diving, video camera studies of foraging strategies, and assessment of reef productivity around the main reproductive sites. No work has been done on the foraging energetics of monk seals; however, plans are being made to expand pelagic ecology studies of juveniles, whose survival rates have decreased dramatically at French Frigate Shoals over the last decade and because of an apparent depletion of prey resources.

Recent deployments of "crittercams" on male monk seals have indicated that foraging occurs primarily in the benthic/demersal habitat at approximately 60 m (198 ft). Seals ignored fish communities in the water column associated with coral reefs and focused on cryptic fauna in transition zones where consolidated substrate, rubble, and debris border areas of sand. Independent video assessments indicate that this types of habitat represents a small percentage of the overall demersal habitat. Future "crittercam" work will focus on the ability to document nocturnal foraging with the aid of a red-shifted light source. This method of observing animal behavior has helped to better characterize nocturnal foraging habitat and will be used in the 1998 field season at French Frigate Shoals.

Species Status from the 1997 Field Studies Results

In 1997, field studies were conducted at French Frigate Shoals, Laysan and Lisianski Islands, Pearl and Hermes Reef, and Midway and Kure Atolls. Three of the most common indices of species' status as derived from these studies are described below based on data from five of the six main reproductive sites. Midway Atoll is excluded from the analyses because past research effort at that site has been sporadic. The first index is the number of pups born. In 1997, 200 births were recorded, which is above the mean of 183 for the period from 1983 to 1995 (excluding 1994, when studies were incomplete). Since 1983, the number of pups born has been highly variable (ranging from 141 to 224) with no clear evidence of a long-term trend.

The second index is a sum of the mean beach counts, excluding pups. In 1958, this sum was 969. By 1985, the counts had declined to 509, and in 1997, the sum was 373. Since 1993, the sum of the counts has been essentially unchanged. For the past decade; however, the trend in the beach counts has been determined largely by the decline in counts at French Frigate Shoals. Beach counts are expected to decline further at French Frigate Shoals because of high juvenile mortality and the attrition of older animals who are not being replaced by recruitment from younger age classes. Thus, the future trend for the species will depend on whether growth at other sites can compensate for the decline at this site.

The third index of the status of the Hawaiian monk seal is the composition of beach counts. Since the mid-1980s, composition has shifted considerably, with the percent of adults rising from about 50% to 70%, and the percent of subadults and juveniles decreasing in a corresponding manner. This shift portends a decline in reproductive recruitment in the near future.

Island-by-Island Description

The observed trends in pups born, beach counts, and composition of beach counts are best explained by studies of individual subpopulations. A brief summary of the six main reproductive subpopulations is provided below.

French Frigate Shoals. In the late 1950s, the subpopulation of seals at French Frigate Shoals was depleted, due largely to human disturbance. After disturbance was eliminated, the subpopulation grew for three decades and by the mid-1980s, abundance was thought to have reached or begun to approach the environmental carrying capacity. Because subpopulations at the other main reproductive sites plummeted during the same period, the overall distribution of monk seals shifted toward French Frigate Shoals, and nearly 50% of the entire species was found at this site in the mid-1980s.

In 1989, the period of growth reversed itself and by 1997, beach counts had dropped by 55%. The primary cause of the problem appears to be related to a decrease in prey availability, which has led to a severe drop in juvenile survival. In the mid 1980s, approximately 80-90% of weaned pups survived to age two. Since 1988-89, survival of these young animals has declined to 20% or lower.

In 1997, studies continued to document juvenile survival rates and to investigate their foraging ecology to better understand factors that may be related to the decline (see the preceding section on foraging studies). Until recently, most pups survived through the nursing and early post-weaning period. However, during the past three years survival of unweaned and newly weaned pups decreased dramatically. In 1997, researchers documented two factors contributing to increased mortality; adult male aggression and shark predation. A primary research goal for 1998 is to investigate and mitigate the loss of young pups.

Laysan Island. Contrary to the long-term trend at French Frigate Shoals, the subpopulation of Hawaiian monk seals at Laysan Island has declined steadily since the late 1950s. It is currently about one-third of its historical maximum size. The cause(s) of the decline prior to the late 1970s is unknown. In 1978, however, abundance at this site dropped considerably due to a large die-off of seals, possibly from ciguatera poisoning (a toxic substance found in some tropical fish). No subsequent die-offs have been observed, but the population has continued to decline slowly.

Since the late 1970s, mobbing has been considered an important, if not the primary, impediment to recovery at this site. Mobbing occurs when multiple males gather and attempt to mate with the same individual seal (usually an adult female, but sometimes an immature seal of either sex). The mobbed female seal is frequently injured or killed, and this loss of females has impeded recovery overall.

Mobbing is thought to occur partially due to an imbalance in the adult sex ratio. Males at this site were found to outnumber females by over two to one. In 1994, 22 adult males were removed from the Laysan population to normalize the sex ratio and hopefully reduce the probability of mobbing. Studies in 1995-1997 have focused on monitoring the rate and consequences of mobbing since removing the adult males. The results indicate that the occurrence of mobbing has been significantly lower

since the removal of males. The males, which have moved to the main Hawaiian Islands, have not returned to Laysan Island. While mobbing seems to have been reduced, recovery at this site likely will be slow, as juvenile survival rates have also been low at Laysan Island. The cause(s) of additional juvenile mortality have not been determined. In 1997, studies continued to investigate and document male behavior, the occurrence of mobbing, and factors influencing the survival of immature animals.

Lisianski Island. The trend of the monk seal population at Lisianski Island has been very similar to that at Laysan Island, but far less research has been directed at the Lisianski population. The cause(s) of the decline at this site are uncertain. The sex ratio at this site has been more skewed toward adult males than at Laysan Island, but the occurrence and rate of mobbing have not been well documented. Nevertheless, mobbing is thought to be an important problem at Lisianski Island.

In addition to mobbing, entanglement in marine debris is considered a serious impediment to recovery at Lisianski Island. Entanglement occurs at all sites and is difficult to quantify because seals may be entangled at sea and not observed. However, Lisianski Island has the highest entanglement rate, and studies of debris deposition and seal entanglement indicate that entanglement-related mortality is partially responsible for the decline of seals at this site. In 1997, research at Lisianski Island focused on characterization of various sources of seal mortality, including mobbing behavior and entanglement.

Pearl and Hermes Reef. The subpopulation of seals at Pearl and Hermes Reef dropped more than 80% in the 1960s, but since 1975 has shown steady recovery. The cause for the decline prior to the mid-1970s has not been confirmed, but may have been related to military activities in the two decades following World War II. The more recent recovery of this population has been vitally important for several reasons. First, the recovery has occurred without intensive management intervention, demonstrating that monk seal subpopulations can recover under natural conditions. Second, the rate of recovery provides a basis for estimating the potential growth rate of these subpopulations, and thereby serves as a reference for research and management. And third, recovery at this site and at Kure Atoll is, helping to counterbalance losses at other sites, particularly French Frigate Shoals. In 1997, study efforts at Pearl and Hermes Reef were directed at identifying the entire subpopulation of seals at this site and verifying that the local recovery continues.

Midway Atoll. The subpopulation of Hawaiian monk seals at Midway Atoll may have been driven extinct on two separate occasions: 1) at the turn of the century when seals were killed for blubber and/or food by seal hunters and ship-wrecked sailors and 2) in the 1950s and 1960s when human activities displaced seals and compromised their habitat. The present population of seals is approximately 45 to 50 seals, most of which are either immigrants from nearby locations or offspring of immigrants. For the last three decades, the seal subpopulation at this site has failed to show signs of recovery.

The primary cause for the decline of this subpopulation has been related to human disturbance during and after World War II, when a Naval Air Station was developed and expanded at Midway. In the 1950s, beach counts of seals numbered in the 50s, but by the late 1960s, few seals were seen at the atoll. Human disturbance continued through the 1970s, 1980s, and into the 1990s. In 1993, the U.S. Naval Air Facility at Midway Atoll was closed and from 1993 to 1997, the Navy has been cleaning and restoring the two main islands in the atoll. In 1997, jurisdiction of the atoll was transferred to the FWS, which will maintain the site as a National Wildlife Refuge.

To manage the atoll, the FWS has entered into a cooperative agreement with a commercial aircraft company that will maintain the atoll's runway. To compensate for the cost of maintaining the runway, the company has established an "eco-tourism" venture that provides educational and recreational opportunities for visitors to Midway. Public education is considered a vital element of the recovery plan for the Hawaiian monk seal, and tourists at this site will have opportunities for observing and learning about these seals. However, the severely endangered status of the Hawaiian monk seal throughout its range, especially at Midway Atoll, requires that such tourist activities must be managed with extreme care to avoid

disturbance of the seals and further obstacles to recovery (see Chapter XI. Public Education and Outreach Programs).

Kure Atoll. The westernmost subpopulation of Hawaiian monk seals is at Kure Atoll and, like other western subpopulations, the number of seals at this site declined severely in the 1960s and 1970s. The primary cause seems to have been related to human disturbance during the construction and occupation of a U.S. Coast Guard (USCG) LORAN station. The station was closed in 1991 and the atoll, which is owned by the State of Hawaii, is no longer inhabited.

The population of seals at Kure Atoll hit a low point in 1986, when only a single pup was born at the atoll. Since then, the number of pups has increased; 18 pups were born in 1997. The increase in pup production is expected to continue and can be attributed to intensive management efforts to recover this population. In the early 1980s, USCG regulations were modified to limit disturbance of seals on the beaches. From 1981 to 1991, NMFS conducted a captive program (referred to as "Headstart") to protect recently weaned female pups from sharks and aggressive adult males during the first months of the post-weaning period. From 1985 to 1995, seals that had been taken from French Frigate Shoals for rehabilitation were introduced to Kure Atoll to bolster reproductive recruitment. A number of these seals, and those that had been included in the Headstart project, have reached reproductive maturity and are now producing pups. In 1997, studies were conducted at this site to ensure that recovery was, in fact, continuing, to quantify the rate of recovery, and to identify any impediments to further recovery.

Management Actions

Lobster Fishery Management

With regard to concerns about the potential impacts of lobster fishing on Hawaiian monk seals, NMFS issued a biological opinion under the Endangered Species Act in 1996. This opinion concluded that the lobster fishery, as it would be conducted under the Fishery Management Plan for the Crustacean Fisheries of the Western Pacific Region (Amendment 9) and its implementing regulations, was not likely to jeopardize the continued existence of Hawaiian monk seals. Although Amendment 9 to the Fishery Management Plan recognizes a potential for impacts to monk seals, NMFS has agreed with the Western Pacific Regional Fisheries Management Council's view that there is no basis to determine that impacts are likely. Moreover, with reduced effort in the fishery due to expanded closures under Amendment 9 and the annual harvest limitation program, the potential for direct entrapment or harm has greatly declined.

Under the 'retain-all' strategy recently adopted by the Council, the potential for direct impacts, due to monk seals feeding on discarded lobster, is reduced. Additionally, the Council requested that NMFS immediately develop a vessel monitoring system (VMS) for the fishery to obtain accurate, real-time position reports of the lobster vessels at sea. With VMS, any lobster fishing activity around the Northwestern Hawaiian Islands (NWHI) would be detected. During the 1996 season, four of the five fishing vessels voluntarily used VMS. In 1997, under a newly established NWHI lobster fishery VMS program (62 FR 35448), all nine fishing vessels employed VMS units. The VMS program enables the Council and NMFS to effectively monitor the position of lobster boats anywhere in the NWHI and respond to fishing activities that would adversely affect the Hawaiian monk seals.

Rehabilitation and Relocation Project

Until recently, one component of the monk seal recovery program was to rehabilitate underweight monk seal pups that would have had a high probability of mortality in the wild. The poor survival rate of young female seals at French Frigate Shoals, for example, has represented a serious threat to the recovery of the Hawaiian monk seal. Since 1984-85, rehabilitation and relocation efforts have been the primary means for salvaging the reproductive potential that would otherwise have been lost with deaths of these young seals.

Female pups were retained in captivity for four to six months to then be released back into the wild at locations, where NMFS was trying to rebuild a viable monk seal populations. Such efforts had been successful at Kure

Island and were attempted to rebuild the monk seal population at Midway Island. In 1995, efforts were made to double NMFS's capacity for rehabilitating seals. Twelve undersized female pups were collected from French Frigate Shoals for eventual release at Midway. Shortly after collection, however, these seals began to show symptoms of an eye ailment never before documented in monk seals or other pinnipeds.

Although extensive diagnostic efforts have been conducted to determine the cause of the ailment, no definitive cause has been identified. Monitoring of these captive seals and diagnostic efforts are still underway; however, the seal pup rehabilitation program has been place on hold indefinitely for fear of its recurrence.

Captive Care Review Panel

In early 1997, NMFS convened a panel of experts (i.e., the Hawaiian Monk Seal Captive Care Review Panel) to examine the ten surviving captive female monk seals, to consider options for their disposition, and to review the implications of the eye ailment for future rehabilitation efforts. The Panel also made recommendations about the Monk Seal Recovery Program as a whole, including the need to undertake/continue research efforts on popu-

Figure 3. Summary of main reproductive subpopulations of the Hawaiian monk seal in 1997.

Site	Research period	Mean beach count* (± sd)	Pups born	Status in 1997	Recent population trends (1983-1997)	Known problems and issues
French Frigate Shoals	8-23 Jan., 8 March to 13 Sept.	111 (± 12.1)	97	Most important breeding site. Depleted, less than one half historical maximum (late 1980s)	Declining at over 10% annually since 1989	Severe juvenile mortality, food limitations
Laysan Island	12 March to 24 July	85 (± 8.9)	37	Depleted, approx. one-third historical maximum (1950s)	Possibly stable	Mobbing (?), and high juvenile mortality
Lisianski Island	10 March to 1 July	57 (± 10.3)	22	Depleted, approx. one-third historical maximum (1950s)	Possibly stable	Mobbing, high juvenile mortality, entanglement
Pearl and Hermes Reef	29 May to 22 July	77 (± 10.8)	26	Depleted, less than one half historical maximum (1950s)	Growing steadily at ca. 7% per year	None at present
Midway Atoll	20 Feb. to 31 Dec.	11 (± 3.4)	11	Severely depleted, approx. one fifth historical maximum (1950s)	Signs of beginning recovery, some growth since 1990, bolstered by immigrants	High juvenile mortality, human disturbance, tourism
Kure Atoll	30 May to 20 July	43 (± 6.3)	18	Depleted, approx. one half of historical maximum (1950s)	Continued recovery after management intervention	None at present

*Excluding pups.

lation assessment, foraging ecology, and wild disease evaluation.

The Panel made the following recommendations:

1. The ten seals currently held at the Kewalo Research Facility should not be released into the wild at this time. Efforts must continue to determine the infectious agent, if possible, and establish protocols for dealing with future outbreaks. Efforts should begin immediately to arrange for a non-NMFS facility to maintain the seals and provide opportunities for future research. If necessary, NMFS should undertake financial responsibility for maintaining these seals for a period of two years. If, at that time, the infectious agent has not been determined or there is no alternate facility willing to accept the animals for ongoing research, they should be humanely euthanized.

2. At present, while focused research is urgently needed to identify other promising management interventions, translocating, and conditioning, undersized pups found in areas where the probability of survival is low, for release at islands where survival may be higher, appears to be the most useful intervention. Until it can be determined to be medically safe, no seals should be taken to Oahu for rehabilitation prior to release to the wild.

The Review Panel determined that the Hawaiian monk seal would be in grave danger of extinction unless NMFS provides comprehensive funding to the recovery program. The panel further recommended that NMFS concurrently undertake the following four activities, recognizing that these activities are closely linked, and that inadequte funding will guarantee the failure of this critical recovery effort:

1. Continue annual high resolution population assessment to determine age-specific and sex-specific survival rates of seals at all sites.

2. Undertake studies of foraging ecology, particularly of younger animals, food availability, and the role of local and ecosystem-wide environmental variations, the latter to determine the ecological and/or epidemiological causes of pup mortality.

3. Efforts should be enhanced and expanded to define and characterize the medical conditions of wild Hawaiian monk seals that may lead to mortality and affect the success of translocation experiments.

4. The captive seals should be studied to develop baseline information on health, epidemiology, immobilization techniques, and reproductive biology.

Relocation of Ten Female Seals

NMFS Southwest Region is in the process of identifying potential holding facilities for the permanent maintenance of the ten captive female Hawaiian monk seals, that have been determined to be unreleasable due to the unknown eye disease.

These captive seals have potential value for future research on virology, behavior, genetics, and captive breeding of the species. It is believed that permanent captivity and relocation of the seals at an appropriate facility is the optimum choice for their long-term care. In the context of the Endangered Species Act (ESA), based on NMFS responsibility to implement the Recovery Plan and in accordance with the Captive Care Review Panel recommendations, relocation of these ten seals is critical. Additionally, federal funds currently being used for the care and maintenance of these ten animals drains the coffer for other conservation and recovery activities for this species as a whole.

Marine Debris and Entanglement

Each year, NMFS biologists at the main reproductive sites remove beach debris capable of entangling seals or other wildlife and disentangle seals that have become entangled. In 1997, at least 16 seals were entangled in debris, and 13 were disentangled by observers. Two of these seals were found in the water, entangled in debris caught on coral reefs. One of these seals drowned, while the other was released unharmed.

The overall impact of marine debris and entanglement on the recovery of the Hawaiian monk seal cannot be fully quantified because of the difficulty of assessing entanglement rates at sea. In past years, efforts to remove

debris from monk seal habitat focused on debris that had washed ashore. In 1996, NMFS initiated a feasibilitiy study to assess the amount and nature of debris caught on coral reefs and the removal of such debris. These studies were conducted at French Frigate Shoals and Pearl and Hermes Reef and demonstrated that extensive amounts of debris can be successfully and safely removed. The studies also evaluated the amount of effort that would be required to remove the debris from the marine habitat of this endangered species. Through 1997, three cruises have surveyed and removed large amounts of debris.

Humpback Whale *(Megaptera novaeangliae)*

North Atlantic

Since 1989, NMFS has participated in the Years of the North Atlantic Humpback (YONAH) project. YONAH is a large-scale international effort that uses photographic identification and molecular genetics to study humpback whales across their entire known North Atlantic range.

The YONAH project has provided new and improved estimates of abundance for North Atlantic humpback whales, as well as detailed information on genetic and demographic population structure, and on migratory movements. The project was also the first study to use genotyping as the principal means of identifying individual animals on a large scale, and to base estimates of abundance upon genetic data.

North Pacific

Dedication of the Hawaiian Islands Humpback Whale National Marine Sanctuary

On February 16, 1997, NOAA formally dedicated the Hawaiian Islands Humpback Whale National Marine Sanctuary. Nearly 500 people attended the four-day event in Kihei, Maui.

The warm, shallow nearshore Hawaiian waters of the Sanctuary are among the most important habitats for humpback whales. Approximately two-thirds of the North Pacific humpback whale population uses this site for breeding, calving, nursing, and other vital activities.

These festivities acknowledged NOAA's and the State of Hawaii's commitment to establish a federal/state partnership for the protection of humpback whales and their habitat in Hawaiian waters. In addition, the event highlighted the important role of the Sanctuary in increasing public awareness regarding the International Year of the Ocean and the need for enhanced marine resource protection.

As the 12th National Marine Sanctuary to be designated, the Hawaiian Sanctuary was officially recognized in 1992 under the Hawaiian Islands National Marine Sanctuary Act. The Sanctuary encompasses approximately 1,400 square miles of federal and state waters, from the 600-foot isobath to the high water mark around the islands of Maui, Molokai, and Lanai, off portions of Kauai and Oahu, and the Northwest coast of the Big Island, Penguin Bank, and the Palilolo Channel. The Sanctuary will be managed by NOAA's National Marine Sanctuary Program in close partnership with the State of Hawaii and NMFS Office of Protected Resources to promote sustainable use and long-term survival of marine resources.

The primary focus of the Sanctuary will be education and research, with guidance from a 25-member Sanctuary Advisory Council. The Sanctuary Program will work closely within the existing permit and regulatory programs administered by the State of Hawaii and NMFS to ensure the long-term protection of humpback whales and their Hawaiian habitat. Because this is an important site for the whales, there are added protective measures in Hawaiian waters under the MMPA, which prohibit approaches by water to within 90 m (100 yds), and by aircraft to within 300 m (1000 ft).

On December 1991, NMFS adopted the Final Recovery Plan for the Humpback Whale. The objectives of the Recovery Plan and the draft Hawaiian Islands Humpback Whale National Marine Sanctuary Management Plan mirrored each other. They include maintaining and enhancing humpback whale habitat(s); reducing human-related mortality, injury and disturbance; measuring and monitoring key population parameters; and promoting a state/federal partnership for administration and implementation of the Recovery Plan.

In order to facilitate the development of a Sanctuary Management Plan, resource managers from NOAA, Sanctuaries and Reserves Division, and NMFS, convened a workshop to assess research and other needs and opportunities related to humpback whale management in the Hawaiian Islands on April 26-28, 1995, at Kaanapali, Maui, Hawaii. The workshop brought together representatives of county, state and federal agencies, representatives of non-government agencies and organizations, resource managers, and researchers to help identify research and management objectives for the Sanctuary. Specifically they were asked to:

1) identify information and uncertainties that should be considered in developing a long-term research plan that meets the management and recovery objectives of the Sanctuary and the Recovery Plan;

2) describe the research and long-term monitoring programs that would be required to characterize the present population status and to detect and monitor trends in life-history parameters of the humpback whale population in the North Pacific (with focus on the Hawaiian Islands);

3) describe the essential components of humpback whale habitat(s) in the Hawaiian Islands; and

4) identify the county, state and federal agencies that would participate in implementating the Recovery Plan and the Final Management Plan for the Sanctuary.

A workshop report providing a summary of the information that was contributed to the workshop by these participants was completed in February 1997 and was published as part of the NOAA Technical Memorandum Series.

The three-day workshop consisted on the first day of presentations by researchers and resource managers, while it focused working group discussions on the last two days. Presentations included such topics as humpback whale life history, humpback whale habitat, human and natural impacts, and individual agency management responsibilities. Workshop participants were divided into four working groups that met several times over the following two days and then shared their discussion results with the other three groups. The four groups examined:

1) methodology,
2) habitat characterization studies,
3) life history studies, and
4) recovery plan implementation needs.

Review of Research and Management Priorities in the Humpback Whale Recovery Plan in the North Pacific

In September 1995, NMFS convened a working group at its National Marine Mammal Laboratory in Seattle, to review the Humpback Whale Recovery Plan relative to completed tasks identified for the North Pacific humpback whale population(s). The group reviewed results of the above-mentioned meeting between the Office of Protected Resources and the Sanctuary Program and developed a draft implementation plan for North Pacific humpback whale recovery, for FY 96-FY 98.

The working group discussed the overall objective of population assessment and monitoring of humpback whales in the North Pacific relative to the management needs of NMFS. There was agreement that recommendations should focus on information needed to evaluate the status and recovery of humpback whale populations in the North Pacific. The following activities were considered essential to evaluating the status and recovery of humpback whales in the North Pacific.

1) maintain the North Pacific Fluke Collection (photo identification catalog);

2) evaluate rates of humpback whale movement within and between geographic regions;

3) estimate North Pacific basin-wide humpback whale abundance;

4) conduct capture-recapture studies off California, Oregon and Washington, which will allow for an updated abundance estimate and evaluation of trends in population size;

5) conduct aerial surveys in Hawaiian waters, which were proposed to follow the development of an aerial survey correction factor in FY96;

6) develop a correction factor for aerial survey estimates;

7) conduct capture-recapture surveys in Hawaiian waters;

8) summarize existing information and expand surveys in Southeastern Alaska to study distribution, survivorship and reproductive success;

9) convene a second workshop to estimate calf mortality;

10) convene a workshop on adult mortality;

11) monitor anthropogenic noise on the wintering grounds using acoustic tags. Anthropogenic noise poses a potential threat to the quality of the habitat used by females to nurse dependent calves in Hawaiian waters. At this time, the technology to adequately monitor the response of humpback whales to anthropogenic noise does not exist. However, based on research supported by the Acoustic Thermometry of Ocean Climate program, a satellite-linked transmitter capable of recording received sound levels, depth of dive information, and position should be commercially available by FY 98. Therefore, a pilot study is recommended to determine the feasibility of attaching such transmitters to two to five females with calves and two to five females without calves on the wintering grounds. The information obtained by such an experiment would be used to design a study that could test the hypothesis as to whether anthropogenic noise could potentially degrade habitat critical for the recovery of humpback whales;

12) develop a Geographic Information System database of whale sightings data;

13) summarize information on physical and biological oceanographic factors that affect the distribution of humpback whales;

14) summarize information on calf distribution in and around the Hawaiian Islands;

15) examine prey biomass and oceanographic data from fisheries surveys. Concurrent collection of marine mammal sightings and prey and oceanographic data was deemed most valuable and the placement of marine mammal observers aboard fisheries survey vessels was recommended; and

16) develop quanititative criteria for downlisting and delisting North Pacific large whales under section 4(c)(2) of the ESA.

Status Review

The ESA requires that, at least once every five years, a review of the species be conductedon the List of Endangered and Threatened Wildlife to determine whether or not it should be:

1) removed from the list,

2) moved from the endangered to the threatened category, or

3) moved from the threatened to the endangered category.

NMFS completed its first five-year review on the status of endangered whales in 1984. A second review was made available in June 1991 (56 FR 29471).

One of the problems with the current process for amending the status of listed species is that there are no objective criteria for classifying large whales as threatened or endangered. In FY95, NMFS contracted the University of Washington to develop criteria that are quantifiable for populations of large whales. Modeling after and building upon recent work by the International Union on the Conservation of Nature (IUCN), the initial approach was to develop quantifying criteria used to classify stocks in various categories of being threatened (i.e., extinct, extinct in the wild, critically endangered, endangered, and vulnerable). The goal of the project is to associate the two classifications under the ESA with five categories under the IUCN classification scheme and then use or revise the quantitative criteria for classifying under the IUCN scheme for classifying large whales under the ESA.

In addition, in September 1997, the National Marine Mammal Laboratory, in cooperation with the Office of Protected Resources, undertook a status review for six of the eight species of large whales that were previously reviewed in 1984 and 1991. The report of this status review is expected to be completed in FY99.

Workshop on Endangered Species Delisting Criteria

In January 1997, a workshop was conducted by the NMFS National Marine Mammal Laboratory (NMML) in Seattle to seek expert opinion regarding ESA classification criteria for the North Pacific population of humpback whales and other populations of large whales. At the workshop, consensus on a general approach for establishing classification criteria was reached.

NMFS and other experts agreed that a population could be "downlisted" from endangered to threatened when all designated wintering and feeding areas maintain a population size such that there is a high probability that it will remain above a specified critical level over the following ten years. An international conservation regime must be in place and be effective in regulating human-related disturbance and mortality of the species as well.

There was agreement that the proposed criteria were sufficiently flexible to be applied to other large whale species for which adequate information was available to determine population structure. Using humpback whales as a starting point, different population structure scenarios will be considered in the context of this classification criteria. In applying the preliminary classification criteria to humpback whales, a number of methods of incorporating uncertainty will be tested. The current ESA criteria are sensitive to assumptions about population structure and will receive further investigation.

The primary method of evaluating the relationship between specific criteria and various parameters such as abundance and abundance trends will involve computer simulations using population models appropriate for species with life histories similar to humpback whales. Additionally, workshop participants believed the proposed criteria could provide a mechanism to address the lack of consistency in ESA classification decisions for both marine and terrestrial species.

Eastern North Pacific Stock of Gray Whale *(Eschrichtius robustus)*

In June 1994, the eastern North Pacific stock of gray whales was removed from the List of Endangered and Threatened Wildlife because of its substantial recovery over the previous 40 years. The ESA requires that stocks/species removed from the list be monitored for a minimum period of five years and its status reassessed at the end of that period of time. Therefore, NMFS developed, and in 1994 initiated, a five-year monitoring and research plan for eastern North Pacific gray whales.

This program will involve monitoring developments in and around the lagoons used by gray whales. Because this monitoring program requires cooperation with the Mexican Government, NMFS scientists have been meeting, and will continue to meet, with Mexican scientists to continue a dialogue on this and other habitat-related issues and monitoring and research programs involving potential habitat destruction in the lagoons.

As another part of the five-year monitoring program, NMFS conducted north- and southbound survey in 1997. Counts of southward migrating gray whales were conducted as they passed the Granite Canyon research station in central California. The northbound surveys were conducted to assess whether calf production was at the levels expected. The project was directed by NMML with assistance from the SWFSC. The abundance estimate in the 1995-96 survey was approximately 22,600. In 1997, support for this research was provided by the NMFS Office of Protected Resource's Marine Mammal Assessment Program. Results of this survey have not yet been analyzed.

In addition to these abundance estimates, the SWFSC conducted five consecutive annual shore-based survey since 1994 to estimate calf production for this stock. In 1994 and 1996, the calf production index, which is derived by dividing the estimate of calves passing Piedras Blancas, California, but the most recent estimate for this stock, were not significantly different from surveys conducted at the same time in 1980 and 1981. In 1995 and 1997, however, the calf production index was signifi-

cantly lower (1995) and higher (1997) than the other survey years. The same survey will be conducted in 1998 and 1999 as part of the five-year gray whale monitoring plan.

During the 1995 meeting of the Scientific Committee (SC) of the International Whaling Commission (IWC) several papers were prepared and presented on gray whales by NMML and the NMFS SWFSC staff. One paper reported a substantial increase in the number and proportion of calves observed during the southward migration, which may possibly be a response to the increase status of gray whales relative to their carrying capacity. The same paper further noted that since the mid-1980s and the mid-1990s, the median date of the southward migration past the counting site in central California has occurred five and nine days later than it occurred in the early 1990s. Another paper reported on the results from the 1994 northward migration to enumerate the number of gray whale calves in the population. This survey was conducted from Piedras Blancas, California. Total calf production was estimated at 1,001 calves (SE 92), which represents 4.3% of the best estimate total population abundance. This survey was done in response to concerns raised over a possible reduction in calf production and indicates that calf production is currently at an appropriate level.

It was also noted during the 1995 SC meeting that 44 gray whales from the eastern North Pacific stock were harvested by Russian subsistence hunters in 1994 under the quota established by the IWC. The SC noted that this level of take was unlikely to adversely affect this population. Subsistence catch limits for the eastern stock of gray whales in the North Pacific for 1995, 1996, and 1997 have been set by the IWC at 140 animals per year, but with the meat and products of the hunt to be used exclusively for local consumption by natives.

Industrial Development of San Ignacio Lagoon, Baja California Sur, Mexico

The Mitsubishi Corporation has proposed industrial development in gray whale breeding lagoons of Baja California Sur, Mexico. The proposed development involving construction of a large-scale salt works facility in San Ignacio Lagoon would potentially interfere with one of the principal winter calving and nursing lagoons for gray whales.

The initial application for a permit to develop the salt facility was rejected by the Mexican Government because the accompanying environmental assessment did not adequately address possible environmental consequences. Subsequently, Mexico's Ministry for the Environment, Natural Resources, and Fisheries established a scientific advisory committee. This committee, including NMFS biologists and other scientists from the United States, Chile, Mexico, and other countries, reviewed scientific data relevant to the project and identified environmental concerns that needed to be addressed. In June 1996, the advisory committee submitted its report to the Ministry, and the Mexican Government has required that Mitsubishi address the concerns identified by the committee in a revised environmental assessment.

The revised environmental impact statement has not been completed, but when it is submitted to the Mexican Ministry for the Environment, Natural Resources, and Fisheries, it will be forwarded to the scientific advisory committee to determine if it meets the criteria set forth in its report. Ultimately, the Mexican Government will make the decision as to whether the project will go forward.

Beluga Whale *(Delphinapterus leucas)*

The National Marine Mammal Laboratory (NMML), in cooperation with NMFS Alaska Region and the Cook Inlet Marine Mammal Council, conducted an aerial survey of the beluga whale population in Cook Inlet, Alaska, during June 11-17, 1996. This provided thorough coverage of the coasts around the entire inlet 1,388 km (833 mi), as well as 1,538 km (923 mi) of offshore transects. Therefore, 100% of the coastal areas where beluga were expected to be during this season were searched one or more times. Most (81%) of the beluga whales seen in Cook Inlet were in the upper Inlet near the mouth of the Susitna River, which is typical of their summer distribution.

The abovementioned surveys were tentatively planned for even numbered years thereafter to monitor trends in the population. However, in light of the unstable status of the Cook Inlet beluga whale stock, NMFS was encouraged by the Alaska Scientific Review Group in 1997 to conduct the aerial survey annually. NMFS acknowledged the poor state of the stock and concurred with the Group's recommendation. Results of the 1997 survey will be available next year.

NMML scientists also conducted annual surveys of Cook Inlet beluga whales between 1993-1997. Reports analyzing data collected through 1996 were completed in 1997 and were reported to the International Whaling Commission's Scientific Committee.

Chapter VIII. Native Take of Marine Mammals

photo by: Kimberlee Beckmen, University of Alaska Fairbanks

MMPA section 101(b) provides an exemption from the moratorium against taking marine mammals for Alaskan Indians, Aleuts, or Eskimos if the taking is for subsistence purposes or for purposes of creating and selling authentic native articles of handicrafts and clothing. These takes; however, may be limited by quota and, in some cases, other regulations if the species involved is determined to be depleted. Two of the five subsistence takes listed below, bowhead whales *(Balaena mysticetus)* in the Beaufort and Chukchi Seas and the northern fur seals *(Callorhinus ursinus)* on the Pribilof Islands, are subject to such limitations. The remainder are undergoing harvest level assessments.

Co-management Agreement with Alaska Natives

In 1994, section 119 was added to the MMPA to clarify that the Secretary of Commerce (NMFS) has the authority to:

"enter into cooperative agreements with Alaska Native organizations to conserve marine mammals and provide co-management of subsistence use by Alaska Natives."

Under section 119, NMFS may provide grants to Alaskan Native organizations to facilitate the:

1) collection and analysis of marine mammal data;

2) participation of the organization in marine mammal research projects;

3) monitoring of Alaskan Native harvests of marine mammals; and

4) development of co-management regimes with federal agencies.

In April 1996, the Indigenous People's Council for Marine Mammals (IPCMM) expressed to NMFS and U.S. Fish and Wildlife Service (FWS) its concern about the need to develop a framework for governing the development of cooperative agreements for individual species of marine mammals. It provided a draft agreement for consideration and, after several workshops and drafting sessions, an official Memorandum of Agreement (MOA)was signed by NMFS, FWS, the U.S. Geological Survey, and IPCMM on August 27, 1997. This umbrella agreement

was designed to assist in the development and implementation of section 119 agreements and promote the sustained health of marine mammal populations utilized for subsistence. The MOA recommends that section 119 agreements consider:

- •collection and analysis of marine mammal natural history and population data
- •development of co-management infrastructures
- •cooperation in enforcement efforts
- •establishment of harvest levels
- •development and distribution of public education materials
- •development of management plans
- •incorporation of traditional knowledge into management decision making
- •training

Species Harvested for Subsistence

Bowhead Whales

NMFS works cooperatively with the Alaska Eskimo Whaling Commission to monitor the bowhead whale *(Balaena mysticetus)* subsistence harvest. Catch limits for the subsistence take of bowhead whales are approved by the International Whaling Commission (IWC). At the 1997 IWC Annual Meeting, a five-year subsistence take quota, which will be shared with the Russian Chukotka Natives, was established. For the years 1998 - 2002, the total number of bowhead whales landed shall not exceed 280. For each of these years, the number of bowhead whales struck shall not exceed 67, except that any unused portion of a strike quota from any year (including 15 strikes from the 1995-1997 quota) shall be carried forward and added to the strike quotas of any subsequent year, provided that no more than 15 strikes shall be added to the strike quota for any one year. The quota was established by the IWC based on a joint proposal by the United States and the Russian Federation.

Steller Sea Lions

An interim Alaska Native Steller Sea Lion Commission was formed in 1994. The Commission was to consist of representatives from Alaska communities that take Steller sea lions *(Eumetopias jubatus)* for subsistence needs, and was formed to improve communication among these indigenous communities, to advocate for conservation of Steller sea lions, to advocate for protection of customary and traditional rights of indigenous peoples with regard to access and use of sea lions, and to serve as the focal point for development of cooperative agreements with NMFS. No substantial progress was made during 1995-96 in establishing a functioning Commission, or in the adoption of hunting guidelines originally proposed by Native hunters.

In May 1997, the Aleutian/Pribilof Islands Association (APIA) and the Alaska Department of Fish and Game (ADF&G), through partial funding from NMFS, sponsored a meeting in Dutch Harbor to address the need for a permanent and effective Alaska statewide Steller Sea Lion Commission. Those in attendance agreed on the need for such a Commission and discussed how it might relate to a regional marine mammal commission, considering that the highest level of subsistence take of Steller sea lions occurs in the Aleutian and Pribilof Islands, and that the species was recently listed as endangered in its western range. After some discussion, the representatives agreed that regional concerns could be most effectively addressed by a statewide commission. It was also determined, however, that the efforts of the Aleutian and Pribilof Islands communities would be primarily focused on the establishment of a regional commission leaving the task of the statewide Steller Sea Lion Commission to others already involved with the initiative.

Accordingly, representatives from Alaska Native communities in the Aleutian and Pribilof Islands region formed a regional marine mammal commission. The purpose of this commission is to address management and other concerns regarding those marine mammal species, including Steller sea lions, taken by these communities for subsistence use. Interim co-chairs were appointed, and it was agreed that bylaws would be drafted and circulated to the respective tribal governments for review and approval. Upon the development of a final draft, a subsequent meeting will be convened to ratify the by-laws and elect officers of the commission. Progress towards these goals continued through 1997, and it is anticipated that both commissions will be formally established sometime in the fall of 1998.

Subsistence Harvest

Under section 10(e) of the ESA and section 101b of the MMPA, prohibitions on the taking of threatened and endangered species normally do not apply to takings by Native Alaskans if such taking is primarily for subsistence purposes and if such taking will not adversely affect the recovery of the endangered stock. To date, no action either under the ESA or the MMPA has been taken to regulate, or otherwise manage, the subsistence harvest of Steller sea lions by Alaska Native groups.

Although Steller sea lions have been a traditional subsistence resource for Alaska Natives in many areas of the state, information on harvest levels prior to the 1990s is limited. Therefore, beginning in 1992, NMFS provided funds to the ADF&G to gather information on the subsistence use of Steller sea lions in Alaska (see Figure 1).

The annual subsistence take has been estimated by ADF&G on the basis of door-to-door surveys with hunters in coastal villages throughout the state. Harvest information is collected by local researchers using retrospective interview surveys in approximately 60 coastal communities, encompassing a range from Cape Newenham in the Bering Sea, west to Atka, and south and east through Southeast Alaska. ADF&G publishes an annual report containing the number of animals harvested and the number struck and lost, data on size, seasons, geographic distribution and age and sex of harvested animals. The results indicate that few animals in the eastern population are killed; the highest recorded annual harvest between 1992 and 1997 is estimated at six animals in 1992. However, the subsistence take from the western population is close to the calculated potential biological removal level each year, and more than three-fourths of the take is by Aleut hunters from the Aleutian and Pribilof Islands.

Data from 1997 as well as the survey process itself are being evaluated. The process requires that hunters recollect their activities over the past year, which may be very difficult and therefore may lead to inaccurate data or unreliable conclusions.

Nevertheless, the available information is sufficient to conclude that the annual subsistence take from the western population is approximately equal or greater than the stock's calculated potential biological removal level. NMFS will work closely with Native hunters, villages, and commissions to ensure that the annual subsistence harvest does not adversely affect the Steller sea lion population.

Subsistence Project

In September 1995, NMFS contracted with ADF&G to sample tissues from the subsistence harvest of Steller sea lions and to increase educational efforts in three Alaska Native communities known to have high annual subsistence harvest levels (St. Paul Island, St. George Island, and Unalaska). Sampling of killed animals involved collection of tissues to determine age, sex, genetic composition, physical condition, reproductive history, and exposure to anthropogenic contaminants (see Chapter X. Marine Mammal Health and Stranding Response Program). Educational efforts were intended to increase Native awareness of the plight of the Steller sea lion and to encourage local management of the subsistence harvest. The contractor, in association with the NMFS Alaska Region, held community workshops to discuss Steller sea lion recovery efforts and to inform hunters of the tissue collection project. This project was continued during 1996/97, and project reports are available.

Figure 1. Steller sea lion take by Alaska Natives

Year	*harvested*	*struck/lost*	*total*
1992	370	179	549
1993	348	139	487
1994	336	80	416
1995	307	32	339
1996	149	30	179

Harbor Seals

Subsequent to the 1997 signing of the MOA between several federal agencies and Alaska Natives, NMFS and the Alaska Native Harbor Seal Commission (ANHSC) started discussions to negotiate a cooperative agreement for harbor seals. In December 1997, the ANHSC pre-

sented the Alaska Region with a draft version of an agreement for consideration. NMFS convened an internal working group to evaluate the draft and to discuss it with the ANHSC. Meetings of representatives of NMFS and the ANHSC are scheduled for 1998 to negotiate a final agreement.

Subsistence Harvest

Since 1992, NMFS has contracted annually with ADF&G's Division of Subsistence, to estimate the annual take of harbor seals within three separate stocks by Alaska Natives. Harvest information is collected using retrospective interview surveys as described above (see Figure 2).

The stability of subsistence takes of harbor seals is indicated by the relatively small annual rates of change, which have varied between -4.0% and +5.0% annually since the beginning of the survey. There has been more between-year variation in subsistence takes at the regional level, with harvests of harbor seals in southeast Alaska in 1995 and 1996 being the largest recorded since the project began in 1992. This likely reflects local hunting practices and community needs. The age and sex composition has also been stable. Considering known sex information, the male to female ratio has been similar across all five of the survey years, ranging from 2.0:1 to 2.4:1.

Figure 2. Harbor Seal Takes by Alaska Natives

stock	*year*	*harvested*
Southeast Alaska	1992	1671
	1993	1615
	1994	1500
	1995	1890
	1996	1858
Gulf of Alaska	1992	967
	1993	914
	1994	913
	1995	724
	1996	735
Bering Sea	1992	229
	1993	199
	1994	208
	1995	127
	1996	148

Gray Whales

In 1997, the United States again asked the IWC to grant approval for an annual subsistence harvest of up to five whales from the eastern Pacific stock of gray whales. The Makah request is unique in that the Tribe's 1855 Treaty of Neah Bay is the only Indian treaty in the United States that expressly reserves a Tribal right to go whaling.

On October 17, the National Marine Fisheries Service released its final Environmental Assessment, which, weighing the impacts of the U.S. government's support of the Makah request to continue their traditional practice of whaling and considering several alternatives, concluded that the harvest of up to five gray whales per year for aboriginal subsistence use would not have a significant effect on the human environment.

Figure 3. Gray Whale Takes by Alaska Natives

year	*harvested*	*struck/lost*	*total*
1992	38	12	50
1993	41	11	52
1994	34	12	46
1995	42	14	56
1996	38	5	43
1997	48	18	66

At its 1997 meeting, the IWC approved, by consensus, a five-year block quota of 620 gray whales *(Eschrichtius robustus)*, with an annual cap of 140 animals. The quota was a joint proposal by the United States and the Russian Federation and was based on an aboriginal subsistence harvest of an average of four gray whales a year for the Makah Indian Tribe, combined with an average of 120 gray whales by Russian natives of the Chukotka region.

Over a five-year period, the joint quota will reduce the number of whales taken by 80 from the existing Russian 140-whale annual quota. The Makah hunt could begin in the fall of 1998, and will be conducted in accordance with a cooperative agreement between between NOAA and the Makah Tribal Council.

Beluga Whales

Statewide Subsistence Harvest

The Alaska Beluga Whale Committee (ABWC) was formed in 1988 to promote healthy populations of beluga whales in Alaskan waters, to obtain better harvest information and to encourage better communication between beluga hunters, biologists, and agencies. Since its formation, the ABWC has met annually to compile reliable harvest information on beluga whale *(Delphinapterus leucas)* takes by Alaska Natives (see Figure 4). Hunters from approximately 50 villages belong to the ABWC and report annual harvest numbers. Cook Inlet hunters are not part of the ABWC.

Figure 4. Beluga Whales Taken in 1996

Location	landed	struck and lost
Cook Inlet	42+	unknown
Bristol Bay	17-18	1
Kuskokwim	2	0
E. Bering Sea	97-109	19-24
Chukchi Sea	118	7
Beaufort Sea	22	18

Cook Inlet Harvest

NMFS is concerned with the Cook Inlet population of beluga whales , which are now being harvested at a rate greater than the Potential Biological Removal level. The small population size (estimated at 830), genetic and physical isolation from other Alaskan beluga populations, and intensive harvest effort may necessitate special designation (e.g., depleted, threatened, or endangered status) of this population and/or harvest limitations in the near future. NMFS is working with the Cook Inlet Marine Mammal Council (CIMMC), an association of area Native tribes which have historically harvested belugas, to conserve these whales while allowing the opportunity for a sustainable subsistence hunt. On January 29-30, 1997, NMFS met with the CIMMC regarding the current level of removals. The CIMMC responded by limiting harvest to three whales for each captain. However, these voluntary limitations were not generally followed. Effective management of these whales is currently hampered by several factors, including two of the following:

The Alaska Native population in the Cook Inlet area includes people from local villages, and well as those who have moved into the region from eslewhere. Those in the latter group may not be members of the CIMMC, or other local tribal groups; therefore, they may not be aware of or willing to abide by the local tribal group harvest guidance and goals.

The MMPA allows for the commercial sale of edible portions of marine mammals in Native villages and towns in Alaska. Beluga whale products are being sold in Anchorage at a significant cash value. As a result, hunters are taking a large number of animals out of Cook Inlet for sale.

Northern Fur Seals

Subsistence Harvest

The subsistence harvest of northern fur seals *(Callorhinus ursinus)* on the Pribilof Islands, Alaska, is governed by regulations published under the authority of the Fur Seal Act and the MMPA. Pursuant to these regulations, NMFS publishes a summary, every three years, of the fur seal harvest for the previous three-year period and a projection of the number of seals expected to be taken in the subsequent three-year period to meet the subsistence needs of the Aleut residents on the Pribilof Islands.

Based on the results of the 1994-1996 harvests and due to responses from the tribal governments on St. Paul and St. George Islands, NMFS published a notice establishing the annual harvest ranges on the Pribilof Islands for 1997-1999, as follows: 300 to 500 fur seals from St. George Island; and 1,645 to 2,000 fur seals from St. Paul Island. In 1997, the subsistence harvest take total was 1,380 fur seals, including 227 animals on St. George Island and 1,153 animals on St. Paul Island. Subsistence harvesting of fur seals was conducted on St. Paul Island for 22 days between July 1, 1997 and August 8, 1997, and on St. George Island on 13 days between June 30, 1997, and August 7, 1997.

As a step toward achieving the maximum utilization of seals harvested for subsistence purposes, the tribal government of St. Paul voluntarily eliminated the "butterfly cut" as a standard method of field dressing harvested seals, and resolved to take only whole animals off the field. The only exceptions to the removal of whole carcasses from the field, as permitted by the tribal government, are:

a) those animals taken to accommodate some of the elder residents who are physically unable to butcher whole animals supplied to them by the tribal government and;

b) those carcasses in which the gall bladder was inadvertently ruptured, thus contaminating some of the meat with bile. This practice began with the 1995 harvest, and during 1997 only five butterfly cut (0.4% of the combined Pribilof total take) seals were taken from the field under these exceptions. The butterfly cut was never a standard field dressing method on St. George Island; therefore, removing only whole carcasses from the harvesting field is now a uniform practice in the Pribilofs.

In cooperation with the tribal governments of St. Paul and St. George Islands and the Pribilof Islands Stewardship Program, NMFS continued to make significant progress toward "full utilization" of the animals taken in the subsistence harvest through the development and re-establishment of traditional art and handicraft skills. Among the most notable uses of the inedible portions of the animals taken are the traditional processing of pelts, throats, teeth, bone and other parts for barter, art and handicraft purposes. The increase in traditional use of these materials has substantially reduced the level of harvest byproducts previously discarded. NMFS will continue to monitor the entire harvest on St. Paul Island and a portion of the harvest on St. George Island during the 1997-1999 seasons.

Chapter IX. Permit Programs

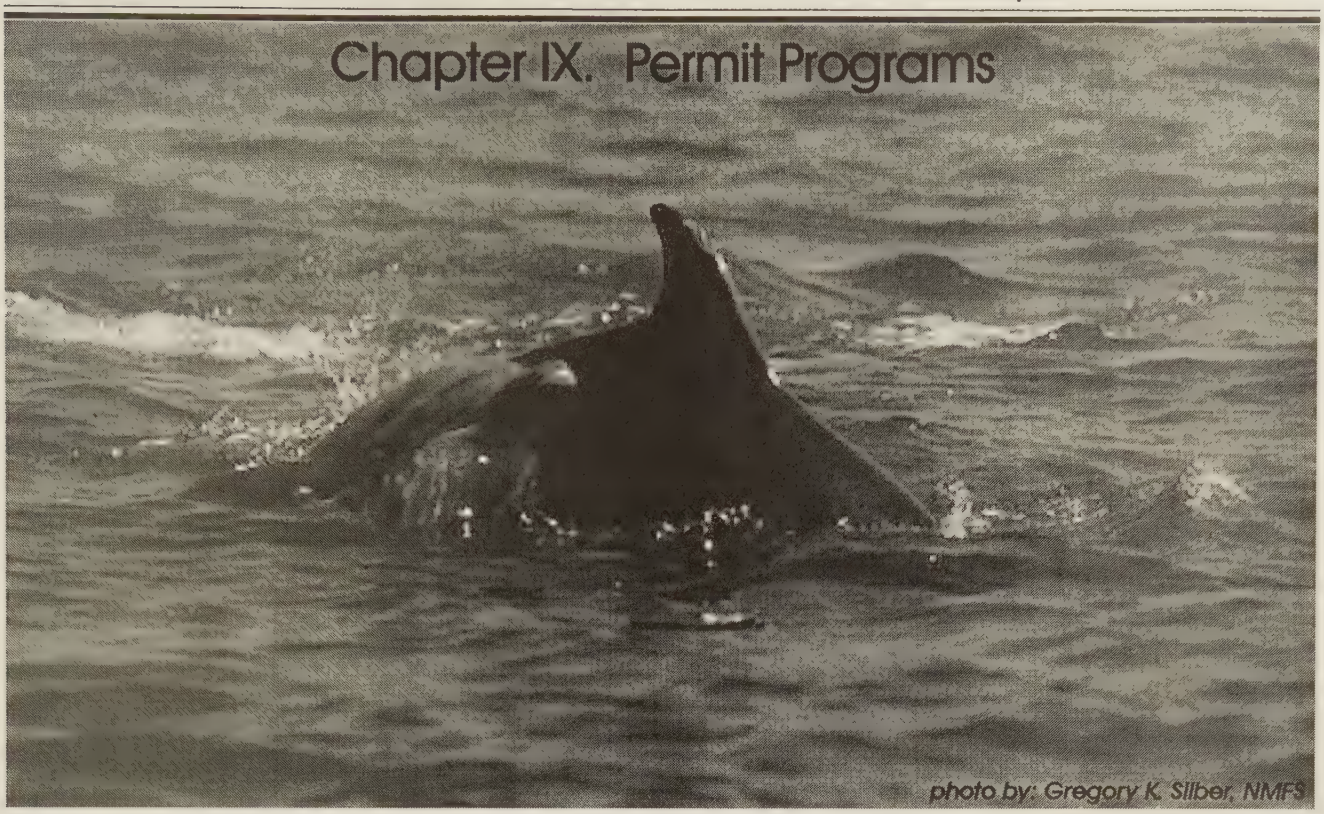


photo by: Gregory K. Silber, NMFS

Public Display, Scientific Research, Enhancement, and Photography Permits

The Marine Mammal Protection Act (MMPA) places a moratorium, subject to certain exceptions, on the taking andimporting of marine mammals and marine mammal products. One exception to the moratorium provides for the issuance of permits by NMFS for specific marine mammal species. NMFS also administers provisions within its permit program, pursuant to the MMPA , the Endangered Species Act (ESA), and the Fur Seal Act (FSA), as they apply to species under the jurisdiction of the Secretary of Commerce. NMFS has jurisdiction over all cetaceans (whales, dolphin, and porpoises) and all pinnipeds (seals, sea lions, and fur seals) except the walrus. Under these statutes, permits may be issued for public display, scientific research, enhancement, and photography.

Between January 1, 1997 and December 31, 1997, NMFS issued 30 permits. Of these, one was issued for public display, 26 were issued for scientific research, and three were issued for photography. In addition, 12 letters of confirmation were issued for "Level B harassment" under the General Authorization for Scientific Research.

NMFS also processes permit amendments if the proposed modifications meet the appropriate statutory and regulatory standards, as well as other permit-related authorizations. There are two amendment categories: major and minor. An amendment of an existing permit, including a request for extension of a permit by more than 12 months beyond its original term, or a request for authorization to continue activities under a permit, is

Level B Harassment is defined in U.S.C. 1362 Sec. 3 (18)(A)(2) as any act of pursuit, torment, or annoyance which --

"has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption or behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering."

usually subject to the same notice, review and comment procedures as a permit application. During the 1997 reporting period, 22 major permit amendments were processed.

Permit Regulations

On May 10, 1996, NMFS published a final rule in the *Federal Register* that amended the regulations for permits under the MMPA, the ESA and the FSA (61 FR 53320). This rule updates and consolidates the regulations for special exception permits and establishes basic permit requirements applicable to all permits to take, import, and export marine mammals and marine mammal parts for purposes of scientific research and enhancement, photography, and public display under the MMPA. It also provides additional permit criteria specific to scientific research and enhancement only and establishes administrative procedures for determining the releasability or non-releasability of stranded marine mammals and their disposition after release.

The final rule does not include the additional requirements specific to photography or public display established by the 1994 Amendments. NMFS will publish a separate proposed rule in 1998 for public comment for public display. A proposed rule for photography permits will be considered in 1999.

Photography Permits

The 1994 Amendments to the MMPA established a new provisions to allow marine mammals in the wild to be photographed for educational and commercial purposes. These permits are limited to "Level B" harassment of non-endangered marine mammals and require that the photographic products be made available to the public. Until final regulations are published, NMFS limits the authorization of photographic activities to one year and requires a report on the activity and its effect on the marine mammals within 60 days of the completion of the photographic work. During 1997, three permits and one permit amendment were issued for commercial photography.

Stranded Marine Mammals

Beached or stranded marine mammals taken under the authority of section 109(h) of the MMPA may be held only for the purpose of rehabilitation until:

1) the animal is returned to its natural habitat;

2) NMFS concurs with a determination by the attending veterinarian that it is not feasible to return the animal to its natural habitat and permanent holding is authorized by NMFS; or

3) NMFS authorizes the permanent retention of the animal as a substitute for the capture of one of the same species from the wild even though the attending veterinarian determines that the animal is releasable.

The permanent retention of a rehabilitated beached or stranded marine mammal must be authorized by NMFS, in accordance with applicable MMPA requirements, before a non-releasable animal may be retained by the rehabilitating facility or transported or exported to another facility for public display purposes. Additionally, the recipient or retaining facility must meet the three public display criteria. During 1997, only one beached and stranded marine mammal was determined non-releasable and was transferred to another domestic facility for public display purposes.

A permit is required to retain or obtain rehabilitated beached and stranded marine mammals for purposes of scientific research, enhancing the survival or recovery of marine mammal species or stocks or to retain a releasable marine mammal for purposes of public display in lieu of a capture.

General Authorization

The MMPA Amendments of 1994 also required NMFS to issue a General Authorization (GA) and implementing regulations for *bona fide* scientific research involving "Level B harassment" of marine mammals in the wild. In lieu of a scientific research permit, the GA provides a simplified process for authorizing research activities in-

volving low levels of harassment for species not listed as endangered or threatened under the ESA. Research activities that are expected to cause no more than "Level B harassment" include photo-identification studies, behavioral observations, and vessel and aerial population surveys. An Interim Final Rule was published on October 3, 1994 (59 FR 50372). Comments on the interim final rule were received, and a final rule will be published in 1998.

From January 1, 1997 through December 31, 1997, NMFS received ten letters of intent to conduct "Level B" harassment on marine mammal species or stocks for scientific research purposes; 12 proposals were approved, including two proposals that were received in 1996.

Marine Mammal Inventory

Information on marine mammals held in captivity must be submitted for purposes of the Marine Mammal Inventory. This inventory included animal-specific data such as animal identification, sex, estimated or actual birth date, date of acquisition or disposition by the permit holder, source of acquisition including location of the take from the wild if applicable, name of recipient if animal is transferred, notation if animal was acquired as the result of a stranding, date and cause of death, and 15-day prior notification of any sale, purchase, export, or transport). Several demonstrations of the Marine Mammal Inventory database were presented during 1997 to representatives of the public display industry including a presentation at the Annual Conference of the Zoo Registrars Association. Other presentations were also given to representatives of U.S. Fish and Wildlife Service, the Marine Mammal Commission, and the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS).

Section 104(c)(2)(A) of the MMPA allows for the public display of marine mammals provided that the holder:

1) offers a program for education or conservation purposes that is based on professionally recognized standards of the public display community;

2) is registered or holds a license under the Animal Welfare Act (AWA); and

3) maintains facilities for the public display of marine mammals that are open to the public on a regularly scheduled basis and not limited or restricted in access except for admission fees.

Exports of Marine Mammals

Marine mammals may be exported from U.S. facilities as long as the foreign recipient meets requirements comparable to those a U.S. recipient must meet.

Because foreign facilities are not subject to licensing or registration requirements under the AWA, it is only through the MMPA's comparability requirement that adequate care of marine mammals transferred to foreign facilities can be assured. Following a policy established in 1975, NMFS continues to require the foreign government with jurisdiction over the facility to provide a certification that includes a comity statement to enable NMFS to enforce the comparability provisions of the MMPA once the animals have been exported.

The Office of General Counsel reviewed the legal basis for the NMFS policy in 1997 and concluded that the requirements are reasonable within the context of the MMPA. This policy will be reflected in the proposed rule for public display to be published in 1998 and will be available public comment at that time.

During 1997 the following live marine mammals were exported:

- two Atlantic bottlenose dolphins *(Tursiops truncatus)* and eight California sea lions *(Zalophus californianus)* to the People's Republic of China;

- eight Atlantic bottlenose dolphins to Zeedierenpark, the Netherlands

- two Atlantic bottlenose dolphins to Dolphin Quest - French Polynesia;

- five California sea lions and one harbor seal *(Phoca vitulina)* to Canada's Wonderland for a seasonal exhibit; and

• two California sea lions to Trilogy Entertainment North, Ltd., Vancouver, British Columbia, Canada, for temporary holding during the production of a film.

As part of the comity arrangements made for exports, inventory of exported animals is maintained by NMFS. In December 1997, two dolphins escaped from Dolphin Quest-French Polynesia; one was recovered and the other is presumed dead.

NMFS Examines Impacts of Sound on Marine Mammals

NMFS is studying activities that may adversely effect marine mammals, including the impact of anthropogenic (manmade) sound in the marine environment. NMFS' goal is to develop new policies and procedures consistent with the MMPA and cognizant of the needs of the affected communities and stakeholders.

As a first step toward this goal, NMFS established an Acoustic Team responsible for ensuring in-house coordination on protected species acoustic issues. The Team is preparing a publication that describes the problems that noise in the marine environment creates, addresses the issue of "harassment" as defined in the MMPA Amendments of 1994 and explores various policy options.

In December 1996, an Interagency Coordinating Group (ICG) was established to explore both individual and common avenues for addressing acoustic issues. The group is comprised of representatives from NMFS, the Marine Mammal Commission (MMC), the Office of Naval Research (ONR), the Minerals Management Service, the U.S. Coast Guard, the U.S. Geological Survey, and the U.S. Army Corps of Engineers.

During 1997, the ICG agreed to sponsor a series of workshops to obtain scientific information on acoustic questions. The first workshop in the series is the Behavioral and Nonhearing Physiological Responses of Marine Mammals to Manmade Sound, to be funded by ONR, planned for late 1997 or early 1998. The second concerns Acoustic Criteria/Impact Assessment, to be funded by NMFS, planned for early or mid-1998. The goal of the latter workshop is to determine under what circumstances producers of anthropogenic sound in the marine environment need apply for an authorization from NMFS.

Scientific Research Permit to Study the Effects of Low-Frequency Sound on Marine Mammals

On September 8, 1997, a scientific research permit was issued to researchers at Cornell University, funded by the U.S. Navy, to gather data on the potential impact of low frequency sound on marine mammals judged to be particularly sensitive to low frequency noise.

The permit authorized the conduct of Phase I of a proposed three-phase study. Phase I involved visual and acoustic monitoring during playback transmissions of blue whales and fin whales. The permit was amended on December 30, 1997, to authorize Phase II. In Phase II, similar visual and acoustic monitoring will be conducted with gray whales during migration. A 30-day public comment period preceded each permit action and approval was based, among other things, on extensive mitigation measures to prevent adverse effects. Environmental assessments were prepared for both phases of the research, and NMFS issued a "Finding of No Significant Impact" for each.

Data obtained from this research are expected to contribute to the completeness and accuracy of an Environmental Impact Statement (EIS), currently being prepared by the Navy, on the proposed worldwide operational employment of a Surface Towed Array Surveillance System - Low Frequency Active (SURTASS - LFA) sonar system. In addition to providing information for the EIS, the research also may contribute to current knowledge about the effects of many other human-made sources of low frequency sound in the ocean, such as shipping. Such data should prove useful in developing policies concerning noise in the ocean.

Visual and acoustic monitoring during Phase I playback transmissions showed no obvious behavioral responses from blue whales *(Balaenoptera musculus)* or fin whales *(Balaenoptera physalus)*. However, although changes in whale vocalizations were not detected in the field, subse-

quent statistical analyses indicated a decrease in vocal activity of fin and blue whales.

The specific goals of Phase III will be to assess the potential effects of LFS on the behaviors, vocalizations, and movements of humpback and sperm whales off the Big Island of Hawaii during mid-February to mid-April 1998. This research "window" allowed for a maximum of 30 days of LFS playback experiments. A subset of the SURTASS-LFA sonar system was used that is specifically adapted for LFS playbacks. A passive array of underwater microphones tracked singing whales, and sophisticated computer models were used to predict the acoustic field generated during the transmissions and potentially sensed by the whales. These models allowed the investigators to precisely control the sound exposure to the individual whale they were following. Extensive visual and acoustic monitoring protocols and mitigation measures were followed to minimize the chance that any marine mammal or sea turtle was exposed to harmful sound levels.

The application for the amendment was received on December 17, 1997 and will be published in the *Federal Register* for public comment in early January 1998.

Public Interaction with Marine Mammals in the Wild

Between May 18-26, 1997, NMFS embarked upon a media and education campaign in Florida to increase public awareness that feeding and harassing wild dolphins is harmful to the animals, dangerous to people, and is illegal under the MMPA. A NMFS team comprised of staff from the offices of Protected Resources, Public Affairs, Enforcement, and the Southeast Region visited four locations in Florida where human/dolphin interactions in the wild are a concern:

1) Panama City/Destin/Ft. Walton Beach,
2) Melbourne/Orlando,
3) the Florida Keys, and
4) Sarasota/ Tampa/St. Petersburg.

Panama City Beach was chosen as the first stop because the problem of public interactions (i.e., feeding and swimming) with wild bottlenose dolphins has a long-standing history in the area. Local television, print, and radio media in each area were provided with a press kit and an opportunity to meet with the NMFS team and key constituent groups from the marine mammal research, conservation and public display communities. The Cable News Network produced and aired a segment for their "Earth Matters" news show, and an *Audubon* magazine reporter accompanied the NMFS team for a feature article in the September/October 1997 issue.

During the campaign, NMFS unveiled a new brochure and poster entitled "**Protect Dolphins - Admire Them From A Distance,**" and announced a new enforcement effort to address this persistent problem in the Southeast. For 1997, NMFS established a contract with the Florida Marine Patrol whereby officers would deter dolphin feeding and harassment and would distribute the new educational materials. The brochure and poster were also distributed throughout the Southeast by NMFS enforcement officers, public display facilities, and environmental groups.

NMFS believes that public awareness is a key factor in effectively addressing this problem because most people who engage in such activities presumably do not realize that they are placing the dolphins and themselves at risk. NMFS is working with researchers, public display facilities, and environmental groups to foster a "wildlife ethic" for the public to follow when in the natural habitat of marine mammals. For the Southeast Region, NMFS encourages passive observation from a safe distance of at least 50 yards with binoculars or a telephoto lens as the best way to observe wild dolphins.

Regarding marine mammal feeding, the regulations explicitly prohibit such activities (50 CFR 216.3). The feeding prohibition was upheld in 1993 by the U.S. Fifth Circuit Court of Appeals, and it *remains* illegal to feed marine mammals in the wild. This regulation is widely supported by the scientific research and environmental communities since provisioning of wildlife is known to be harmful. An in-depth review conducted by NMFS, outside marine mammal experts, and the MMC, deter-

mined that feeding marine mammals in the wild is contrary to the mandates of the MMPA to protect individuals, species and stocks of marine mammals, and alters their behavior in ways that place them at increased risk of injury and death. Repeated exposure to humans and human activities has been correlated with increased risk of interactions between these animals and vessels and fishing activities, vandalism, and ingestion of inappropriate and contaminated food items. In addition, feeding may impact their ability or willingness to forage for food. This latter alteration in behavior is of particular concern for young animals who need to learn foraging skills.

Regarding "Swim-With-Dolphin" (SWD) programs in the wild, NMFS is concerned that such activities are harassing the animals. Unlike whale watching activities which are supposed to be conducted from passive observational platforms, SWD programs conducted in the wild seek out and interact with dolphins in a manner that has the potential to disturb the animals' natural behavioral patterns. SWD activities in Panama City, Florida are of particular concern because they are directly facilitated by illegal dolphin feeding. In Hawaii, SWD activities that target Hawaiian spinner dolphins (*Stenella longirostris*) are encroaching upon the dolphins' daytime resting areas in shallow bays and coves, and there is concern that the dolphins are being disturbed and harassed by swimmers and, most notably, that offshore movements in response to such harassment may make them more vulnerable to shark predation. Plans to continue the public education campaign are in place for 1998.

Update on Release of Captive Marine Mammals to the Wild

Releasing long-term captive marine mammals has the potential to harm both the released animals and the wild marine mammals they encounter. Experts are concerned about the ability of a released animal to hunt for food, defend itself from predators, and avoid interactions with people and boats. Other concerns include disease transmission and unwanted genetic exchange between a released animal and wild marine mammal stocks, as well as any behavioral patterns developed in captivity that could affect the social behavior of wild animals as well as the social integration of the released animal.

NMFS maintains that in order to protect the health and welfare of marine mammals, any release should be conducted only under a MMPA scientific research permit. Applications for such permits are subject to scientific and public review, and would involve the development of a release protocol that addresses important concerns such as whether or not:

1) a released animal is properly and humanely prepared to live in the wild;

2) long-term follow up monitoring of the animal is conducted;

3) wild marine mammals are affected; and

4) contingency plans are in place if it is necessary to rescue a released animal.

Unauthorized Release of Florida Dolphins

Two separate unauthorized releases of captive dolphins occurred in Florida during May 1996. The first involved two female dolphins who were released into the Indian River from their ocean pen allegedly by vandals. Neither dolphin was recovered, and there were no confirmed sightings of them in 1996 or 1997. As a result, it is not clear whether or not they survived. The second incident involved two male dolphins who were released to the wild off the coast of Key West, Florida and were later successfully rescued by NMFS with the assistance of several law enforcement and marine mammal organizations.

In 1997, charges were filed against several parties for harassing and illegally transporting the two male dolphins in connection with their deliberate release six miles off the coast of Key West. After the dolphins were released, they were found injured, emaciated, and begging for food from boaters in local marinas. Alleging multiple violations of the MMPA, NOAA assessed a maximum allowable fine of $10,000 for each of the six counts charged, resulting in a total of $60,000 in penalties against those involved.

Keiko the Killer Whale

NMFS had discussions in 1997 with the Free Willy-Keiko Foundation with regard to possible plans for the future retention or release of "Keiko," a captive killer whale (*Orcinus orca*), that attracted worldwide attention for his starring role in the movie "Free Willy." The permit issued in September 1995 for the import of this animal includes a condition requiring a scientific research permit be in place prior to release. The Foundation is exploring the possibility of relocating "Keiko" to a sea pen in the North Atlantic for continued public display, while continuing to evaluate whether an eventual release is appropriate.

Captive Care of Marine Mammals

When the MMPA was amended in 1994, NMFS' role in specifying care and maintenance standards for captive marine mammals was eliminated. This responsibility now belongs solely to the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS). To implement this change, NMFS has taken the lead in revising a 1979 Memorandum of Agreement (MOA) among NMFS, U.S. Fish and Wildlife Service and APHIS. Several meetings were held in 1997 with the parties and representatives of the Marine Mammal Commission to resolve differences in several areas of concern including the respective responsibilities, lack of jurisdiction and determinations associated with the export of marine mammals to foreign facilities. A final agreement is expected to be signed in 1998 and will promote the effective and cooperative implementation of the MMPA and the Animal Welfare Act (AWA) particularly as they related to the standards governing the humane handling, care, treatment, and transportation of captive marine mammals and to ensure the responsibilities of the agencies under the MMPA and AWA are met efficiently and with a minimum of duplication.

Negotiated Rule-making

During 1995-1996, NMFS was included as a non-voting observer to the USDA-APHIS negotiated rule-making process to revise the marine mammal captive care standards under the AWA. This federal advisory committee consisted of several voting and non-voting ("observer") members. NMFS suggested that the advisory committee address certain practices authorized under the AWA that could potentially impact marine mammals in the wild which are under the jurisdiction of the MMPA. Specifically, open-water pens and releases of captive marine mammals to the wild for various purposes (i.e., filming, scientific research, swim-with programs) have the potential of facilitating disease transmission and unwanted genetic exchange between captive animals and those in the wild. NMFS recommended that facilities with open-water pens be required to have closed-water system quarantine pools.

In addition, NMFS recommended that the proposed rule include an explicit reference to the MMPA requirement that captive marine mammals may only be released to the wild under a scientific research permit issued by NMFS. Also, NMFS suggested that the regulations which allow the public to feed captive marine mammals (i.e., feeding or petting pools) be amended to require that the public be informed that feeding and interacting with marine mammals in the wild could be harmful to the animals; why it could be harmful, and that feeding is prohibited under federal law. These recommendations were not adopted by the committee; however, they may be offered again as comments on the proposed rule.

The proceedings of this negotiated rule-making are currently under consideration by USDA-APHIS for possible publication of a proposed rule-making on the AWA care and maintenance standards. APHIS is working on the proposed rule and expects to publish it in 1998.

Public Display Applications

Four applications for public display were considered during 1997. One was issued, two applications were withdrawn, and one was denied.

Sea World, Inc.

An application was submitted by Sea World, Inc., for a permit to import one adult beluga whale *(Delphinapterus leucas)*, from the Vancouver Aquarium in Stanley Park, Vancouver, B.C., Canada, to Sea World's San Diego fa-

cility. Although the whale had been in captivity at Vancouver since his collection in 1980, the proposed import was controversial. In 1992, the Canadian Minister of Fisheries and Oceans announced a ban on the capture of beluga whales from Canadian waters for export to other countries. Commenters contended that the Canadian government policy would apply to this import; however, the Canadian government issued a CITES export permit from Canada. The proposed import was determined to be consistent with the purposes and policies of the MMPA, and NMFS issued a permit on July 9, 1997.

Dallas World Aquarium

An application for a public display permit was submitted by the Dallas World Aquarium. The applicant requested authorization to import four Amazon River dolphins *(Inia geoffrensis)*. The dolphins would be collected from the Apure river near San Fernando, Venezuela and maintained temporarily at the J.V. Seijas Aquarium in Valencia until the public display facility at the aquarium in Dallas was completed. This application was very controversial because this species has an extremely poor record of survival in captivity, had been on the candidate species list for ESA listing, and was listed as an IUCN species of concern. Following the close of the public comment period on September 15, 1997, the applicant withdrew the application stating it would not capture any wild dolphins in Venezuela and would surrender its collection license to the Venezuelan Service Agency PROFAUNA.

Big Apple Circus

The Big Apple Circus, Walden, New York, submitted an application to import two Patagonian sea lions *(Otaria byronia)* from Conny-Land, a public display facility in Lipperswil, Switzerland, to travel with the circus for its 1997-1998 exhibit season. During their 14-month stay in the United States, the animals would be accompanied by their trainer from Conny-Land and maintained at the applicant's new facility in Walden, New York when not traveling with the circus. This application was highly controversial. During the comment period, commenters raised several issues including the humaneness of the original collection and various inconsistencies in the chain of custody of the animals. When the comment period ended on September 29, 1997, the applicant was informed of the issues and given an opportunity to address them or to withdraw the application. On October 29, 1997, the applicant withdrew the application.

M&M Amusement Park

M&M Amusement Park, Caguas, Puerto Rico, applied for a permit to temporarily import three South American sea lions *(Otaria flavenscens)* and two Atlantic bottlenose dolphins *(Tursiops truncatus)* for a traveling exhibit to the cities of San Juan, Ponce, and Mayaguez. This application was particularly controversial since a traveling exhibit involving cetaceans has never been issued a permit by NMFS. This application was denied based on several issuance criteria for public display permits, e.g., applicant did not hold an exhibitor's license issued by the USDA-APHIS; there were several areas of noncompliance with animal welfare regulations; and failure to identify the professionally recognized standards on which the education program was based. Furthermore, there were several inconsistencies regarding the chain of custody of the sea lions. Additionally, the U.S. Customs Service advised that the prohibition of the import of Cuban-origin merchandise into the United States applied to dolphins captured in Cuba.

Closure of the Maine Aquarium

After going into bankruptcy during the summer of 1997, the Maine Aquarium went into receivership of the Small Business Administration. In September 1997, APHIS notified NMFS that the aquarium no longer held a valid Exhibitor's license under the AWA. APHIS determined that they could not take action under the AWA to place the seals in an appropriate home and asked NMFS for assistance to ensure that the public display requirements under the MMPA would be upheld. APHIS offered the assistance of a veterinarian inspector who was familiar with the situation, and the Detroit Zoo was contacted and agreed to take custody of the seals. The NMFS Offices of Protected Resources and Northeast Region Enforcement plan to take temporary custody of the seals during the first week of January 1998.

Chapter X. Marine Mammal Health and Stranding Response Program

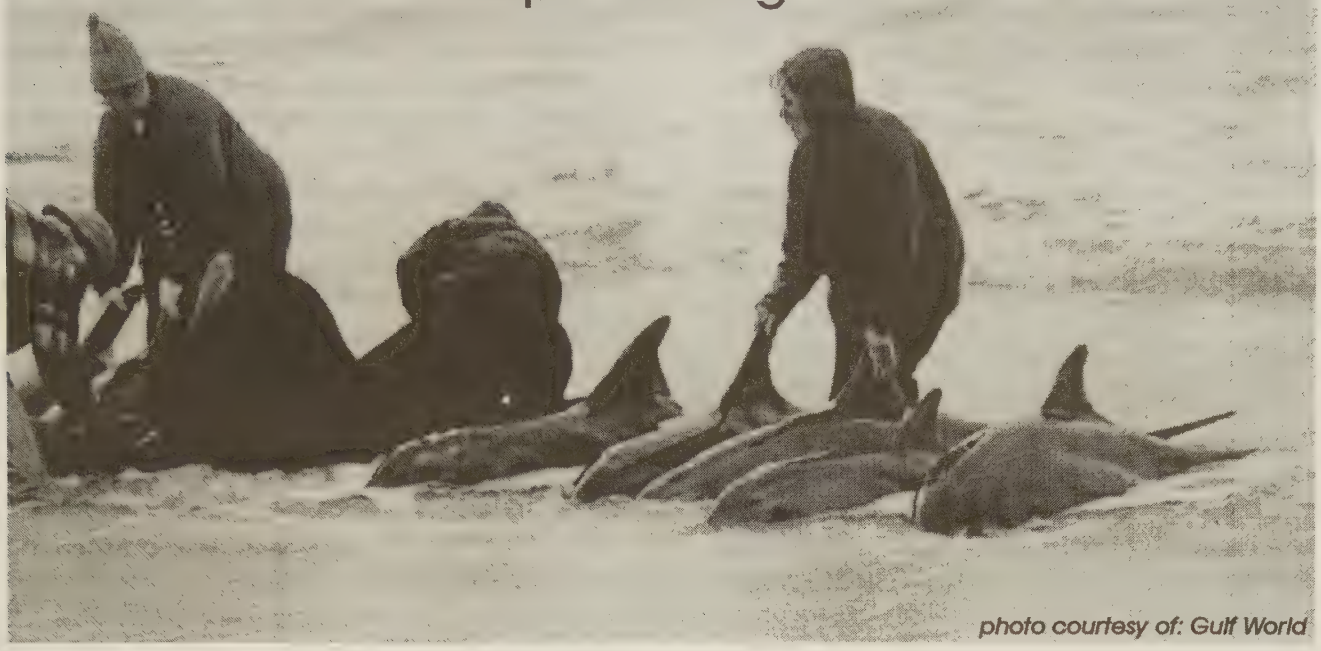


photo courtesy of: Gulf World

In 1992, the Marine Mammal Health and Stranding Response Act (MMHSRA) was enacted and became Title IV of the MMPA. It contains three basic elements: Marine Mammal Stranding Networks; Response to Unusual Mortality Events; and the National Marine Mammal Tissue Bank.

To implement the Act, NMFS has instituted the Marine Mammal Health and Stranding Response Program (MMHSRP) that includes:

- stranding networks;
- response to unusual mortality events;
- monitoring;
- the National Marine Mammal Tissue Bank;
- quality assurance; and
- information management.

Stranding Networks

Marine Mammal Stranding Networks have been established in each of NMFS' regions and are organizations, facilities, or individuals that meet minimum requirements as designated in a Letter of Agreement (LOA) for marine mammal responses and can be states, aquaria, universities, or non-profit organizations. Most of the people carrying out the responsibilities of the stranding networks are volunteers. Different levels of authorization may apply (e.g., response to live stranded animals is generally limited to those institutions that have medical expertise and the physical facilities to rehabilitate animals).

As a part of their LOA, network members are required to collect certain basic biological data (Level A data) including species name, sex, length, location, and any evidence of human interaction. In addition, they are encouraged to collect other data and tissues for use in scientific research, for determination of cause of death, for additional evidence of human interactions, for educational purposes, for life history investigations and other biological research needs.

Northeast Region Stranding Network

The Northeast network consists of letterholders in ten states from Maine to Virginia. A total of 597 marine mammal strandings were reported in the Northeast Region in 1997. These reported strandings included 351

pinnipeds and 246 cetaceans. Although the total stranding numbers are larger in 1997 than in 1996, this represents a small decrease in numbers of pinniped strandings and an increase in the numbers of cetacean strandings.

The increasing trend in strandings of ice seals has stabilized and there were fewer harp (119) and hooded (40) seal strandings in 1997 than in 1996 (153 and 46 respectively). Nevertheless, these animals continue to move out of their traditional habitat ranges and strand as far south as Florida an dPuerto Rico. Most of these animals show signs of nutritional stress and are often in a weakened state when found.

Consistent throughout this decade, bottlenose dolphins (74) and harbor porpoises (82) comprised the majority of the cetacean strandings in the Northeast. Of interest for large whales was an increase in minke whale strandings (15) for the Northeast region. Of the 20 large whale strandings noted in the Northeast, two were fishery related and one was a ship strike.

Southeast Region Stranding Network

In 1997, 608 marine mammal strandings were reported in the NMFS Southeast Region was a decrease from the 1996 levels (795). Of these strandings, only three were pinnipeds with the remaining 605 being cetaceans. Consistent with previous years, bottlenose dolphins comprised the majority of cetacean strandings (490).

In 1997, there was a relatively high number of live strandings (95) in the Southeast region, which included a mass live stranding. Excluding the mass stranding, the live strandings included three pinnipeds and 57 cetaceans. Similar to previous years, pygmy sperm whales and bottlenose dolphins were the two highest live stranding species. Of those live-stranded, only four animals were rehabilitated and released in the Southeast in 1997, and these were all bottlenose dolphins.

A mass stranding of rough-toothed dolphins *(Steno bredanensis)* took place at Cape San Blas, Florida on December 14, 1997. Although over 60 animals were initially reported, by the time the response personnel were on the scene, 35 live animals were on the beaches. Due to strong winds and high seas, the animals could not be immediately taken offshore and were instead moved to a protected bay. On the second day of the stranding event, only 16 animals remained alive, and they were moved to rehabilitation centers.

As a result of the efforts of volunteers and response personnel, full necropsies and sample collections were done on all the dead animals. Samples were collected for histopathology, serology, toxicology, specimen archival and life history. Of the 16 animals taken to rehabilitation centers, four are being rehabilitated with the goal of releasing them back into the wild.

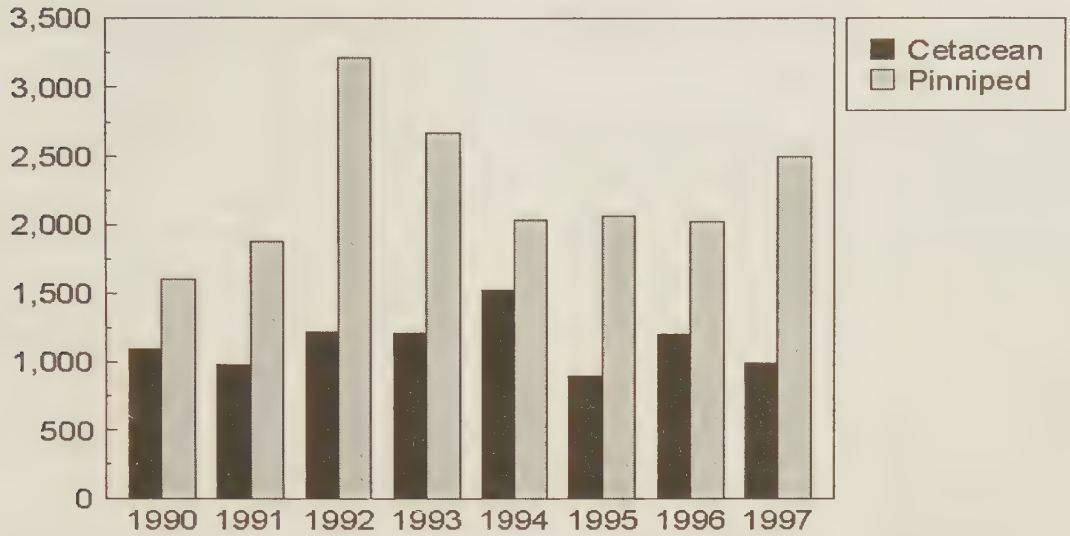
Rough-toothed dolphins usually live in small groups, although groups of 100 animals have been reported. They are pelagic animals and live in tropical to warm temperate areas. Strandings of this species rarely occur except in the southeastern Atlantic-Caribbean and Gulf of Mexico where strandings of small numbers occur at one to five-year intervals. This large mass stranding was a rare event and provided a unique opportunity to learn more about this species.

During the spring, summer, and fall of 1997, the Mid-Atlantic area had a beach-based observer program for the coasts of Maryland, Virginia, and North Carolina. This beach-based observer program was coordinated through the University of North Carolina, Wilmington and was funded through the NMFS Southeast Fisheries Science Center. Regular surveys of the beach increased the reporting of stranded animals and the detection of fishery interactions. In addition, the group was better able to determine the timing of fishery-related mortalities.

Southwest Region Stranding Network

The NMFS Southwest Regional stranding network is comprised of two distinct areas, California and the islands of Hawaii. A total of 2,176 marine mammal strandings were reported to the Southwest Region in 1997, made up of 2,048 pinnipeds and 115 cetaceans. The numbers of animals released back into the wild after rehabilitation were 504 pinnipeds and one cetacean. For pinnipeds, this number is significantly higher than normal, and these stranded animals were primarily comprised of California sea lions *(Zalophus californianus)* (1252)

National Marine Mammal Strandings 1990-1997



and northern fur seals *(Callorhinus ursinus)* (50). As with the 1996 strandings, there were also strandings of harbor seals *(Phoca vitulina)*, elephant seals *(Mirounga angustirostris)*, two Guadalupe fur seals *(Arctocephalus townsendi)*, and seven Steller sea lions *(Eumetopias jubatus)* in California. The increased strandings were attributed to the El Niño event that raises the water temperature near the coastline, moving the preferred prey items into deeper, less accessible waters. These changes make foraging difficult for newly weaned pups. As a result, many do not survive the yearling stage. In addition, many young nursing pups do not survive to weaning, as their mothers take extended feeding trips, are not able to nurse them as often, and the pups die due to extreme malnourishment.

The resulting forced change in prey items may make the pinnipeds more susceptible to the introduction of "new" pathogens such as parasites and other disease-causing organisms. This could further impact these animals by compromising their already stressed immune systems.

Gray whale *(Eschirictius robustus)* calf strandings are increasing on the coast of California, with one being taken to Sea World in San Diego for rehabilitation. A total of six gray whale calf strandings occurred in 1997. Four of these were live strandings, and only one was taken into captivity for rehabilitation.

Northwest Region Stranding Network

The Northwest Regional stranding network covers the coasts of Oregon and Washington including the Puget Sound coastline. The NMFS Northwest Region stranding networks reported a total of 268 strandings, of which 249 were pinnipeds and 19 cetaceans. Thirty-two harbor seals were rehabilitated and released alive in 1997; however, no cetaceans were rehabilitated and released. Peak stranding numbers were reported from the summer months, coincident with the harbor seal pupping season in the inland waters of Washington. Field biologists and stranding network personnel continue to evaluate the incidence of brucella in marine mammals from this region in cooperation with state and federal laboratories.

Alaska Region Stranding Network

The Alaska Regional stranding network covers a tremendous amount of coastline, however much of it is uninhabited or inaccessible. A total of 26 cetacean strandings and 32 pinniped strandings were reported to the Alaska Region. Of these, six animals were released back into the wild (five harbor seals and one ringed seal). Twelve of the cetacean strandings were baleen whales, of which six showed evidence of human interactions (ship strikes and fishery interactions).

Unusual Mortality Events

In response to the deaths of hundreds of bottlenose dolphins on the East Coast of the United States in 1987-1988, Congress added Title IV to the MMPA. Title IV included a number of provisions for dealing with unusual marine mammal mortality events. It called for the establishment of three main components: the Working Group on Unusual Marine Mammal Mortality Events, a contingency plan for such events, a fund to support the response of such events (contingency fund) and a data management system.

Section 304 of the MMHSRA directed NMFS to establish a Working Group on Unusual Marine Mammal Mortality Events, which was formalized in 1992. This group consists of individuals from a range of scientific disciplines, including veterinary medicine, pathology, epidemiology, toxicology, and marine mammal science, who are appointed to the Working Group for three-year terms. The Working Group is consulted when an unusual mortality event is suspected, determines whether such an event is actually occurring, and provides advice on specific actions that should be taken to respond to an event, as well as determine when the event is over. The Working Group held their annual meeting in April, 1997 in which they reviewed the 1996 mortality investigation results.

In calendar year 1997, the Working Group was consulted three times concerning possible mortality events in the United States. Only one of the events resulted in an active investigation of a possible cause, while the other two events were considered recurring phenomena and were monitored.

From March 25, 1997 to August 30, 1997, 90 harbor seals *(Phoca vitulina)* stranded in the vicinity of Point Reyes, California. Eighty-two percent of the stranded seals were adults and 68% were adult males. At this time of the year, the harbor seal population in the area typically numbers about 5,000 animals. In the previous ten years, only three stranded adult harbor seals had been recorded.

As in previous mortality events, most of the animals were too decomposed to provide samples for detailed analyses. Only eleven seal carcasses were fresh enough to conduct full necropsies and to obtain tissues for examinations. These animals exhibited similar lesions and had lungs which were heavier and larger than normal. All had severe pneumonia, and two also had brain lesions. Serological testing was negative for herpes virus, morbillivirus, and influenza virus. Bacterial cultures showed a wide range of secondary pathogens, and water testing for harmful algal blooms was negative throughout the event. Based on the pathology results, the scientific team is still investigating an infectious etiology. At this time, no definitive causative agent has been identified; however, work continues on tissues and blood collected during the event. The Marine Mammal Center in Sausalito, California lead the response, and the University of California, Davis has been leading pathological examinations.

In October 1997, the Working Group was consulted on two further events affecting pinnipeds in California. Because both events represented periodic events, the Working Group only recommended that they be monitored.

There was a slight increase in the number of California sea lion *(Zalophus californianus)* strandings. There were 111 in September and 45 in October, with elevated numbers again in November. Simultaneously, stranding network members observed an increase in the number of sea lions with leptospirosis. Leptospirosis is enzootic (limited) to California sea lions, and it periodically occurs in increased numbers in stranded animals, primarily juvenile males.

Whenever an El Niño occurs, large numbers of pinnipeds are affected. Large mortalities of pinnipeds occured during the El Niño year of 1982-83 and 1992-93. Another major El Niño event began in 1997. A distinction can be made between mortality patterns of otariids (sea lions and fur seals) and phocids (true seals such as elephant seals). In the case of otariids, mortalities are normally due to nutritional deficiency. Changes in water temperature affect the prey base, and large numbers of animals (particularly young animals) starve. However, in the case of phocids, mortalities are almost entirely storm-related as rookery areas are flooded and mothers and pups are separated.

Beginning in October, stranding network members reported a marked increase in northern fur seal *(Callorhinus ursinus)* strandings. Virtually all of the 38 stranded animals documented were severely emaciated pups. In a normal year, only 10-15 northern fur seals strand in California. These fur seals are from a southern population that breeds on San Miguel Island, where the normal pup count on the island is about 2,000. Researchers on the island observed 75% pup mortality before weaning. Those that survived to weaning had very low weights and may have been among the animals that stranded later. Researchers estimate that the total annual cohort will be lost. Because of differences in the breeding cycle, the numbers of stranded California sea lions had not increased markedly by the end of the year, but it is estimated that 2/3 of their annual cohort will be lost as well.

Internationally, there was one significant mortality event involving the critically endangered Mediterranean monk seal *(Monachus monachus)*. Two subpopulations of the species exist, one on the Mediterranean coast (~500 seals) and one off the Mauritania coast (~300 seals). The Mauritanian coast population experienced a mortality event from May to mid- July 1997. Stranding investigators recovered 117 carcasses and estimated that more than half of this western Sahara population died. Two morbilliviruses and paralytical shellfish poisoning biotoxin have been identified in the laboratory from tissues of necropsied seals. No definitive cause has been determined; however, both the biotoxin and morbillivirus have been implicated in the mortality event. This event clearly shows how devastating mortality events can be to already compromised species.

Biomonitoring Program

In partial response to the MMHSRA, NMFS initiated a Biomonitoring Program in 1991. The program consists of:

1) real-time or retrospective evaluation for contaminants, disease, and health;
2) method development and validation;
3) research on problem characterization;
4) specimen archival; and
5) quality assurance correlation of contaminants and health.

The main goals of the biomonitoring component are to provide baseline information on contaminant levels, incidence and types of disease, human-related impacts on populations and baselines on the health of populations of marine mammals.

Marine Mammal Pathology

In 1997, the Armed Forces Institute of Pathology (AFIP) and the NMFS participated in the last year of a three-year interagency agreement. A new interagency agreement will be negotiated in 1998. AFIP provides histopathology support to stranding investigations, mortality events and disease or contaminant studies in addition to providing training to stranding networks. AFIP also participates in the Working Group on Unusual Marine Mammal Mortality Events.

During 1997, the Department of Veterinary Pathology issued diagnostic histopathology reports on 134 marine mammals, which included 86 cetaceans, 27 seals or sea lions, six walruses and five sea otters. The species examined consisted of:

38	*Tursiops truncatus*
9	*Kogia breviceps*
6	*Delphinus delphis*
4	*Delphinapterus leucas*
4	*Balaena mysticetus*
4	*Stenella attenuata*
3	*Phocoena phocoena*
3	*Kogia simus*
2	*Orcinus orca*
2	*Megaptera novaeangliae*
2	*Globicephala macrorhynchus*
1	*Grampus griseus*
1	*Stenella coeruleoalba*
1	*Globicephala melas*
1	*Physeter macrocephalus*
1	*Eschrichtius robustus*
1	*Balaenoptera acutorostrata*
1	*Eubalaena glacialis*
1	unid. dolphin
1	unid. beaked whale
11	*Zalophus californianus*
5	*Phoca vitulina*
4	*Monachus schauinslandi*

3	*Cytophora cristata*
2	*Erignathus barbatus*
2	*Phoca groenlandica*
16	*Odobenus rosmarus divergens*
5	*Enhydra lutris*

AFIP pathologists also participated in investigations of increased mortalities in harbor seals at the Point Reyes National Seashore of California. AFIP pathologists also provided field assistance to necropsy a right whale *(Eubalaena glacialis)*, a pygmy sperm whale *(Kogia breviceps)*, and three bottlenose dolphin *(Tursiops truncatus)* calves. Finally, AFIP personnel participated in two training workshops for field personnel and scientists.

Disease Collaborations

During 1997, the NMFS entered into a five-year interagency agreement with the National Veterinary Services Laboratory (NVSL) of the United States Department of Agriculture (USDA). In this agreement NVSL will assist NMFS in disease investigations by:

1) performing retrospective analyses of serum for pathogen exposure;
2) validating tests for brucella;
3) investigating incidence and potential pathogenicity of brucella;
4) assisting with mortality investigations as needed;
5) developing control materials for specific pathogens;
6) performing interlaboratory comparison exercises for specific pathogens; and
7) participating in the Working Group on Unusual Marine Mammal Mortality Events.

Forensic Workshop

In July 1997, NMFS hosted a training workshop, entitled "Forensic Investigations of Marine Mammal Mortalities," for stranding network participants. This national training workshop was held in Charleston, South Carolina and was attended by 51 stranding participants, with representation from each of the regional networks. Topics of discussion included: forensic investigations, unusual mortality investigations, general pathology, evidence of human interactions, infectious diseases, biotoxins, large whale response, and case studies.

Program Review

In April of 1997, NMFS held an external review of the MMHSRP. Twenty U.S. and international scientists reviewed the MMHSRP and offered individual recommendations on the program's progress and direction. The reviewers were divided into two panels: stranding networks and biomonitoring; although, there were several issues that overlapped and were addressed as a larger group. Joint issues that were discussed and examined were: unusual mortality investigations, overview of the program, as well as legal and management responsibilities. The stranding group reviewed issues involving live animals, funding, human resources, data bases, accountability, and sample collections. The biomonitoring group reviewed issues relating to research projects, biomonitoring programs, disease surveillance, health assessment, specimen banks, quality assurance, and risks of contaminants to marine mammal health. A final report on the discussions will be available in 1998.

Contaminants

The contaminants component of the MMHSRP includes biomonitoring, archiving, and quality assurance. The Environmental Conservation Division (ECD) of the Northwest Fisheries Science Center serves as the NMFS lead for the quality assurance and biomonitoring components of the MMHSRP. The contaminants biomonitoring program began in 1991 with pilot projects in the Northeast and Southeast. It has expanded since that time to include sampling in all regions of the U. S. In FY97, over 400 tissue samples from a number of tissues and fluids (e.g., blubber, liver, kidney, brain, heart, lung, muscle, melon, blood, milk, stomach contents) from the following species were either acquired or analyzed for chlorinated hydrocarbons (CHs) and essential and non-essential elements:

Sowerby's beaked whale (*Mesoplodon bidens*)
beluga whale (*Delphinapterus leucas*)
bottlenose dolphin (*Tursiops truncatus*)
bowhead whale (*Balaena mysticetus*)
California sea lion (*Zalophus californianus*)
gray whale (*Eschrichtius robustus*)
harbor porpoise (*Phocoena phocoena*)
harbor seal (*Phoco vitulina*)
bearded seal (*Erignathus barbatus*)
humpback whale (*Megaptera novaeangliae*)

killer whale (*Orcinus orca*)
northern elephant seal (*Mirounga angustirostris*)
pilot whale (*Globicephala melas*)
pygmy sperm whale (*Kogia breviceps*)
ringed seal (*Phoca hispida*)
Risso's dolphin (*Grampus griseus*)
short- (*Delphinus delphis*) and long-beaked (*Delphinus capensis*) common dolphin
Steller sea lion (*Eumetopias jubatus*)

These samples were collected for a variety of projects:

1) ongoing monitoring of contaminants in samples collected during subsistence hunts (e.g., beluga whale);

2) collection of tissues for the Specimen Bank project (e.g., beluga whale, harbor seal, Steller sea lion);

3) analysis of tissues from cetacean and pinniped species that stranded and for which there are limited data (e.g., pygmy sperm whale);

4) continued investigation of relationships between contaminant exposure and disease (e.g., California sea lions with metastatic transitional cell carcinoma);

5) evaluation of immune function and other health effects in northern fur seal pups will be evaluated in relation to concentrations of CHs in tissues; and

6) special studies on killer whales.

The following briefly describes three of the above studies.

California Sea Lions. Causes of the high prevalence of cancerous tumors found in many adult California sea lions that stranded along the central California coast are unclear. Relationships between accumulation of anthropogenic contaminants and tumors are being assessed using a nearly unique data set acquired in cooperative efforts between the University of California, Davis, the Marine Mammal Center, and NMFS. The data set is comprised of chemical analyses of pollutants and detailed pathologic examination and life-history parameters within a resident population of California sea lions that has both diseased and non-diseased animals. The goal of this work over the past four years has been to determine whether or not there are differences in the tissue burden of toxic chemicals in California sea lions that died from trauma (e.g., gunshot) compared to animals exhibiting disease, specifically transitional cell carcinoma. Results of the initial set of analyses revealed significantly higher concentrations of CHs (i.e., PCBs, DDTs) in blubber of sea lions diagnosed with neoplasia than those measured in trauma animals. Preliminary analyses of selected liver tissue showed significantly higher CH concentrations in sea lions with cancer compared to the trauma animals. In FY97, approximatley 30 additional samples were analyzed for CHs, and interpretation of how the additional data support and augment previously observed relationships is underway.

Northern Fur Seals. Although populations of northern fur seals on St. Paul Island in the Pribilofs are relatively stable, the annual pup production of fur seals on nearby St. George Island has declined for unknown reasons. Studies of the northern fur seal have identified differences in the forage areas and prey species of the St. Paul population compared to the St. George population. These differences could result in diverse patterns of exposure to chemical contaminants, and it is hypothesized that these contaminant exposures could lead to immune dysfunctions which could increase mortality. As a collaborative effort with the University of Alaska-Fairbanks, the relationship between immunological parameters in fur seals and chemical contaminant data (e.g., CHs) was examined by analyzing samples of blood, milk, and blubber from northern fur seals from the Pribilof Islands for selected chlorobiphenyls and other selected organochlorine compounds (e.g., hexachlorobenzene, p,p'-DDE). To perform these studies specialized methods for analysis of CHs and lipid in blood were developed, and approximately 200 blood, blubber, and milk samples were analyzed. These CH results and the data from immunological tests are currently being evaluated.

Killer Whales. A variety of biological factors including sex, age, and reproduction can influence the concentration of CHs in marine mammals. Studies of contaminant levels in live animals for which substantial biological data are available are much more likely to reveal links between biological population effects and contaminant

disposition than studies with stranded animals. In FY97, CHs in approximately 40 blubber biopsy samples of killer whales from Prince William Sound pods were analyzed. Animals from two distinct killer whale pods, one composed of marine mammal-eating transient whales and a second composed of fish-eating resident whales were analyzed. As expected, mean PCB and DDT concentrations were significantly higher in the marine mammal-eating group of whales. Although there was a wide variation in contaminant concentrations among individual animals, there was a trend for females with calves to have very low concentrations compared to their offspring. These results demonstrate the importance of specific biological data on sampled animals for the interpretation of the results of contaminant analyses. Studies will continue in 1998.

National Marine Mammal Tissue Bank

The National Marine Mammal Tissue Bank (NMMTB) was established in 1989 and was formalized in 1992, with the amendment to the MMPA. NMFS has continued the strong relationship with the National Institute of Standards and Technology to support the National Marine Mammal Tissue Bank and the contaminants Quality Assurance project. In 1997, the NMFS and NIST entered into a five-year interagency agreement in support of the National Marine Analytical Quality Assurance Program, which was established in 1995. As part of this agreement, NIST is establishing a satellite specimen bank for marine specimens, analytical laboratories, and an SRM production facility in Charleston, South Carolina, as part of NOAA's Marine Environmental Health Research Laboratory. The NMMTB and the marine mammal quality assurance project are both included in this agreement. Specimens are collected from Alaska with support and collaboration of the United States Geological Survey/Biological Research Division (USGS/BRD) and Mineral Management Service through the Alaska Marine Mammal Tissue Archival Project (AMMTAP), a component of the National Marine Mammal Tissue Bank.

Since its beginning, specimens of blubber, liver, and kidney have been routinely collected for the NMMTB. In 1997, the development of protocols for the collection and banking of blood specimens for contaminant analysis began, and 249 specimens were collected and banked from 80 animals. Six new species were added to the bank (*Balaenoptera physalus, Steno bredanensis, Phoca groenlandica, Halichoerus grypus, Cystophora cristata,* and *Enhydra lutris*). As of December 31, 1997, the inventory of NMMTB specimens includes 918 specimens collected from 332 animals representing 22 species:

52 bowhead whale (*Balaena mysticetus*)
1 fin whale (*Balaenoptera physalus)*
12 long-finned pilot whale (*Globicephala melas*)
13 harbor porpoise (*Phocoena phocoena*)
10 Atlantic white-sided dolphin (*Lagenorhynchus acutus*)
9 common dolphin (*Delphinus delphis*)
15 rough-toothed dolphin (*Steno bredanensis)*
45 beluga whale (*Delphinapterus leucas)*
13 harbor seal (*Phoca vitulina)*
60 ringed seal *(Phoca hispida)*
2 larga seal *(Phoca largha)*
4 harp seal *(Phoca groenlandica)*
3 gray seal *(Halichoerus grypus)*
3 hooded seal *(Cystophora cristata)*
10 bearded seal *(Erignathus barbatus)*
1 northern elephant seal *(Mirounga angustirostris)*
4 Steller sea lion *(Eumetopias jubatus)*
21 northern fur seal (*Callorhinus ursinus)*
18 California sea lion (*Zalophus californianus)*
20 Atlantic walrus *(Odobenus rosmarus rosmarus)*
28 polar bear (*Ursus maritimus)*
3 sea otter *(Enhydra lutris)*

Less than half of the banked specimens have been analyzed for chlorinated hydrocarbons and inorganic constituents. In 1997, banking procedures were modified in order to provide to ECD aliquots of all samples entering the bank for real-time contaminant analysis.

Also in 1997, specimens were provided to four projects conducting research on marine mammals. Aliquots of blubber and liver samples of male polar bears collected in Alaska were provided to the Canadian Wildlife Service Lab and to the Mississippi State Lab for chlorinated

hydrocarbon and trace metal analysis. This was done at the request of and in collaboration with the U.S. Fish and Wildlife Service and the USGS/BRD as part of a polar bear monitoring study. Aliquots of liver samples from *Phoca hispida*, *Erignathus barbatus*, *Delphinapterus leucas* and *Globicephalus melas* were provided to Karl-Franz University Graz in Austria for studies of organic forms of arsenic in marine mammals.

Liver samples from *D. Leucas* collected at Point Hope, Alaska, were provided to the NMFS Southwest Fisheries Science Center as part of their beluga whale genetics investigations. Blubber samples from *U. maritimus*, *P. hispida*, *D. leucas*, and *E. barbatus* were provided to the Denver Zoological Gardens for their studies on vitamin D_3 deficiencies in polar bears. Data and reports on all four of these projects will be provided to the NMMTB in 1998.

Quality Assurance Program

The Quality Assurance (QA) program was initiated in 1992 in response to the legislative mandate to improve the quality of chemical contaminant data for marine mammals and has proceeded as a collaborative effort between NIST and NMFS. This program principally involves two approaches: the development of control or standard reference materials using marine mammal matrices (tissue and fluids) and interlaboratory comparisons. Control material and standard reference materials are developed on an as-needed basis. At least annual interlaboratory comparisons are performed with external labs for both organic and inorganic analyses.

In 1997, approximately 30 tissue samples, including proposed reference/control materials were analyzed as part of a NIST intercomparison and QA exercise for the measurement of essential and non-essential, potentially toxic elements in marine mammal tissues. A three-laboratory intercomparison study was carried out in the certification of a marine mammal standard reference material. The NMFS Northwest Fisheries Center, NIST, and Texas A&M University analyzed a whale liver control material for use in the NIST/NOAA Marine Mammal Quality Assurance Program and the development of a Standard Reference Material (SRM). A second aspect to the program was analysis of a split sample by the three laboratories to establish analytical comparability. The NMFS internal laboratory QA results were very good with small Relative Standard Deviations for replicate analyses of several tissues for most elements. The results from both external labs was transmitted to NIST for comparison.

As a second interlaboratory comparison, congener-specific PCB and chlorinated pesticide data generated by NWC/ECD, NIST, and Department of Fisheries and Oceans Canada on the same blubber samples from Cook Inlet, Alaska, beluga whales were completed and transmitted to NIST for comparison of results. Also during 1997, NIST provided guidance, quality control materials, and SRMs to the U.S. Fish and Wildlife Service (FWS) funded laboratories involved in the Alaska polar bear contaminant monitoring program (refer to National Marine Mammal Tissue Bank section). In 1998, FWS will provide the results to NIST for comparison.

The interlaboratory comparison studies described above enable the analytical scientific team to assess and improve the quality of analytical measurements of marine mammal tissues.

Chapter XI. Public Education and Outreach Programs

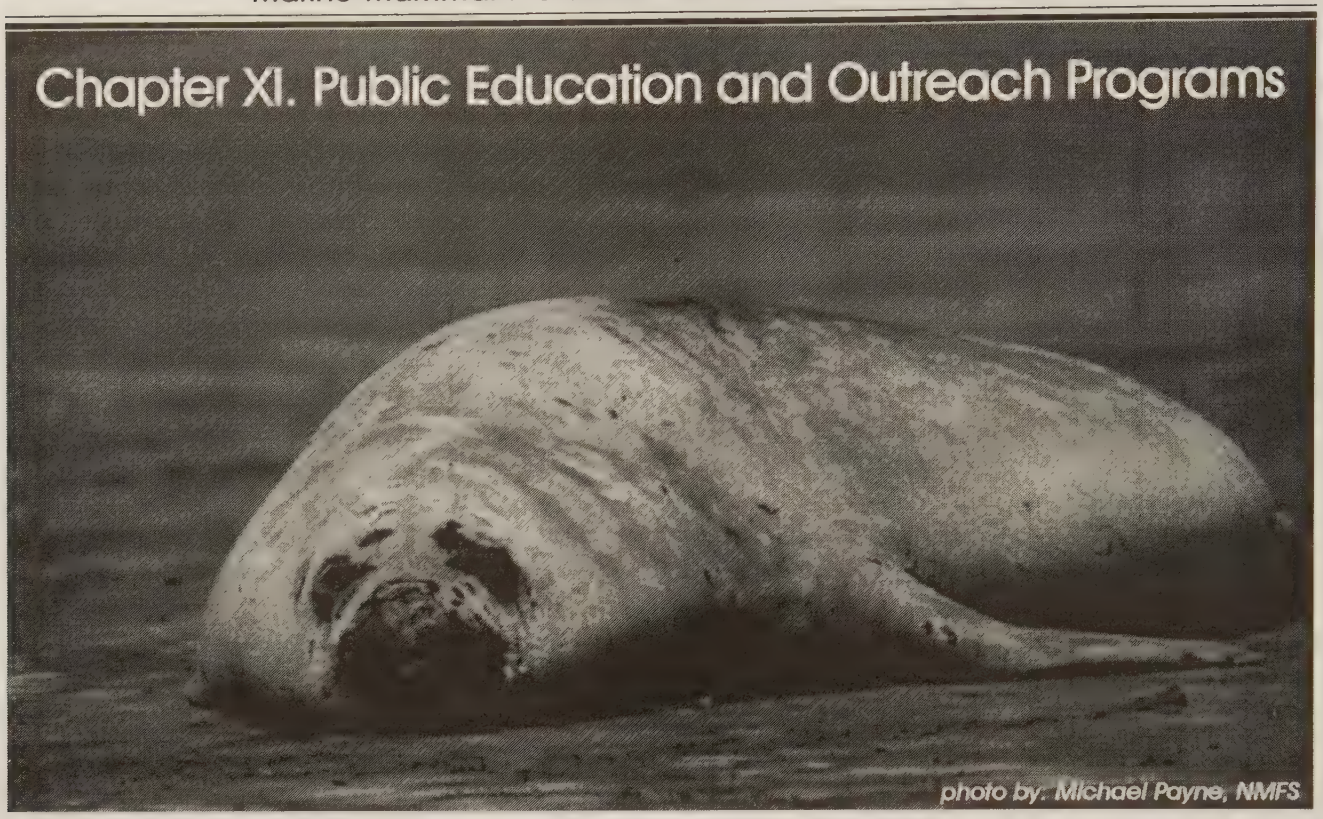


photo by: Michael Payne, NMFS

As a part of implementing its programs, NMFS supports numerous public outreach and education efforts through its headquarters office as well as in each of its regions. Some of these outreach efforts are solely NMFS coordinated, but the vast majority of these projects have been undertaken as a part of collaborative efforts between NMFS, other governmental agencies, and/or non-governmental groups to promote common goals and/or policies.

Public outreach is critical to conveying NMFS' messages and announcing new programs as well as changes in existing ones. Outreach programs allow the public access to consumable information about federal policies and initiatives in their area of interest. NMFS and its programs affect a broad variety of people from fishers, to managers, to environmentalists, to policy-makers. Some of these efforts directly address particular programs. Descriptions of these outreach initiatives can be found in their respective sections of this report. Although NMFS publishes numerous technical memorandums and other scientific documents, much of its constituency is not reached with them. Although a variety of printed materials such as newsletters, brochures, flyers, and informational posters have served to educate members of the public about NMFS' programs, one document, the Marine Mammal Protection Act (MMPA) Annual Report to Congress, has been published annually since the enactment of the MMPA in 1972.

National Efforts

MMPA Bulletin

One of NMFS' primary outreach tools is the *MMPA Bulletin*. The *Bulletin* is a quarterly publication of the Office of Protected Resources and is designed to increase public awareness of and participation in the MMPA regulatory and implementation process. The first edition, published in September 1994, included a description of the 1994 Amendments to the MMPA, and subsequent editions have focused on NMFS' efforts to implement the Amendments. Those currently on the *Bulletin's* mailing list are primarily fishers as well as members of the environmental community, marine mammal science field, state and federal agencies dealing with protected species issues, Native American groups, public display facilities, and Congress.

The *MMPA Bulletin's* readership increased dramatically from approximately 1,800 at the end of 1995, to 2,400 in 1996, and to over 3,000 in 1997. This increase is partially attributed to posting announcements about the availability of the *Bulletin* on key internet listservers, such as "MARMAM" and "WILDLIFE HEALTH" as well as on the Office of Protected Resources web site at:

www.nmfs.gov/tmcintyr/prot_res

This site attracts a large amount of additional attention to NMFS and its programs. Although the vast majority of the readership is in the United states, international interest in the *Bulletin* has recently increased. Persons in 45 countries around the world receive the *MMPA Bulletin*, with Canada and the United Kingdom having the most recipients, 96 and 24 individuals on the mailing list respectively.

Posters to Remind Fishers to Report Incidental Injuries and Mortalities

The 1994 Amendments to the Marine Mammal Protection Act required all commercial fishermen to report any incidental injuries or mortalities of marine mammals to NMFS within 48 hours of returning to port; however, daily logbooks of fishing activity are no longer required (see Chapter III. Reducing Interactions Between Marine Mammals and Commercial Fisheries). To remind fishermen of their reporting responsibilities under the MMPA, the Office of Protected Resources and the Center for Marine Conservation have developed a poster for display at fishing ports and marinas. Funding was also provided by the Norcross Wildlife Association.

The poster depicts a fishing vessel at sea, with the caption:

"Before you head home.... remember to fill out a marine mammal reporting form."

There are two versions of the poster, one depicting a typical east coast fishing vessel, and one depicting a typical west coast vessel. These posters will be displayed in shops or other facilities that fishermen frequent and will be sent out free of charge upon request.

Regional Efforts

Northeast Region

Outreach activities are integral to all components of the Atlantic Large Whale Take Reduction Plan. In 1997, NMFS worked with the Sea Grant offices at the University of Maine and University of Rhode Island to set up an outreach program in the New England and Mid-Atlantic areas. Sea Grant organized several meetings, workshops, and seminars at key fishermen's forums held in the fall 1997 (and planned through spring 1998) covering the area from North Carolina to Rhode Island. Sea Grant also prepared outreach handout materials and videos for use at these and other forums and for the local meetings set up in the Northeast. NMFS has also hired a Maine Plan Coordinator to work closely with the unique Maine Lobster Zone Council system to carry out outreach education and gear research collaboration at the dockside level.

Additional outreach efforts will provide the results of gear research to fishermen and serve as a conduit for suggestions from fishermen to the Gear Advisory Group and/or directly to ongoing gear researchers. NMFS will continue to support the Maine Plan Coordinator and will work with Massachusetts and Rhode Island to develop similar dockside outreach efforts in their areas.

NMFS has also committed its support to the expansion of the Disentanglement Network to provide full-time coverage for the entire Gulf of Maine (see Chapter VI. Conservation and Recovery Programs). Significant efforts will be made in Maine in the spring of 1998 to educate fishermen about proper reporting and operational procedures regarding entangled whales. Approximately half of the fishermen in attendance indicated a desire to participate in additional training to further assist in any disentanglement efforts in their area. Additional meetings will be held along the East Coast to include fishermen who could not attend the first round of meetings. Fishermen who attend these workshops will be considered Level One participants. Responsibilities of fishermen at Level One are to observe, report, and stand by to monitor entangled whales. Additional training, called Level Two training, is scheduled to begin in late spring.

The Center for Coastal Studies and NMFS staff are initiating a coordinated plan for disentanglement response in the Southeast as well. NMFS anticipates that the fishers training workshops conducted in Maine will be a good template for similar training in the Southeast and other key areas along the East Coast. For additional information about the disentanglement network, see Chapter VII. Conservation and Recovery Programs.

With expansion of the disentanglement network planned for 1998, new protocols will be described to fishermen in a series of workshops with coastal lobster associations as a continuing part of the outreach effort. The Early Warning System will also be expanded to summer-fall periods and will involve sightings information from fishermen. These new procedures will be included in the 1998 outreach efforts.

Northwest Region

Each year, coastal residents in the Northwest Region encounter marine mammals, alive or dead, that stimulate varying degrees of interest, concern, or anxiety and result in numerous telephone calls for assistance. These calls are received by state and local agencies with responsibilities in shoreline areas, wildlife management and public safety. The NMFS-Northwest Region, in cooperation with the NMFS Office of Law Enforcement - Voluntary Compliance Program, Olympic Coast National Marine Sanctuary, the Washington Department of Fish and Wildlife, the Oregon Department of Fish and Wildlife, and Oregon State University, conducted a series of workshops for police officers, health department officials, personnel from national, state and county parks, port district employees and others, to advise them on the needs of marine mammals and promote awareness of marine mammals as a normal part of the wildlife diversity in this area.

The Northwest Region also issues seasonal notices to the public on the occurrence of harbor seal pupping during the spring and summer months. These news releases remind the public that seals need to use shoreline habitat during pupping and that live animals found on beaches are to be left undisturbed.

Southeast Region

Individuals from the NMFS Southeast Region office along with representatives from NMFS Office of Protected Resources, Public Affairs, and members of the Southeast Enforcement Office participated in an "anti-feed" campaign to educate the public about the potential dangers of feeding and harassing wild dolphins. These efforts in 1997 primarily focused on public education and outreach (see Chapter IX. Permit Programs).

Members of the Southeast Implementation Team (SEIT) for the Northern Right Whale Recovery Plan have also coordinated a number of outreach efforts to educate mariners about the threat of ship strikes in right whale habitat by distributing brochures, fliers, videos, posters, and other information on right whales and the threats that vessel traffic poses to them. The Team and/or its participating agencies have developed brochures and pamphlets on whales, manatees and turtles, which are being distributed regionally. As a group, the Port Authorities prepared a series of posters, distributed by the harbor pilots when they board a vessel for navigation, which describe when right whales are in nearby waters.

One member of the SEIT, with NMFS support, developed a quarterly newsletter, "Right Whale News." The newsletter is edited by members of the SEIT, but anyone actively involved in right whale conservation efforts may contribute including ship operators, harbor pilots, port authorities, fishermen, educators, scientists, managers, policy makers, non-governmental organizations and other concerned citizens. Relevant information on right whales from other areas is also included. The first edition of the newsletter was published in August 1994, and it has been published continuously since.

Southwest Region

Monk seals resting on Kauai's beaches are often disturbed by beach goers. Recently, the Hawaii Department of Land & Natural Resources' (DLNR), Division of Aquatic Resources (DAR) established the Kauai Monk Seal Watch Program (MSWP), a partnership of government agencies (i.e., NMFS and the County of Kauai) and the public to respond to all reports of seals hauled out along Kauai's shoreline. Augmented with community volunteers, MSWP's mission is to sustain and enhance the Ha-

waiian monk seal and its habitat by instituting a management and monitoring program that encourages community participation and promotes environmental education and cultural awareness. In 1997, NMFS' Marine Mammal Research Program has continued its active involvement in the MSWP.

The MSWP government-volunteer network seeks to promote education and appreciation of monk seals by providing on-site information when Hawaiian monk seals are hauled up on Kauai's beaches. MSWP volunteers protect the animals by keeping visitors at appropriate distances, fencing off mothers with pups, and posting signs and information flyers in the vicinity of the animals. Volunteers also record seal-human interaction and seal behavior, as well as annotate "scar cards" used for seal identification to be incorporated into the NMFS monk seal database. In the spirit of sound ecotourism and environmental awareness, the MSWP combines legitimate scientific research with public outreach to foster an appreciation for the precarious state of the Hawaiian monk seal (see Chapter VII. Conservation and Recovery Programs).

NMFS has had an active role in community environmental education and cleanup efforts as well. Specifically, NMFS personnel provided guidance to The Ocean Recreation Council of Hawaii (TORCH), a local environmental awareness group, in planning and orchestrating a Net Debris Cleanup effort on the west coast of Oahu. The project received considerable media coverage, and has spawned increased community interest in protecting and rehabilitating Oahu's coastal reef ecosystem. The MMRP continues to be a steward in the area of coastal reef clean up. Additional cleanup projects are planned tapping the momentum of the TORCH project success, and utilizing resources of other state and federal agencies.

NMFS remains dedicated to promoting public awareness for one of Hawaii's most precious endangered species. NMFS is in the process of updating literature and information flyers as part of a campaign to promote monk seal awareness to local school children.

Alaska Region

AK Marine Mammal Viewing Guidelines

With the increasing popularity of wildlife viewing in Alaskan waters the commercial viewing industry is expanding rapidly. To create greater awareness of responsible marine mammal viewing, the Alaska Region has implemented a wide-ranging public education campaign directed at tour operators, their clients, as well as local and transiting members of the public. Information has also been disseminated to other state and federal agencies for distribution to their constituents. The Alaska Protected Resources Division, with assistance from the regional Public Affairs Office, produced a brochure entitled "Alaska Marine Mammal Viewing Guidelines." This brochure explains the MMPA and ESA authorities, which prohibit the "taking" of a marine mammal and details guidelines to follow that would prevent possible violations of the "take" prohibition. The Guidelines detail responsible marine mammal viewing from water-based, land-based and aircraft-based platforms; the main points are also provided in a summary description. The Guidelines provide information on pinniped and cetacean behaviors that could be indicative of disturbance and would indicate that viewing behavior should be modified.

The Alaska Region also produced a laminated poster with the Guidelines' summary. The poster has been placed in all major ports from which wildlife viewing is conducted. The Guidelines summary has also been published as paid advertisement in coastal marine publications and in newspapers of coastal communities. The University of Alaska Sea Grant office also created a laminated poster for distribution that restates the Alaska Marine Mammal Viewing Guidelines. The Office of Protected Resources conducted public meetings and meetings specifically with charter boat associations to discuss the Guidelines and appropriate operating practices. These meetings were held in Juneau, Sitka, Ketchikan, Wrangell, Petersburg, Gustavus, Seward, Homer, and Anchorage.

Pribilof Islands Stewardship Program

The Alaska Region continues to be closely involved with the Pribilof Islands Stewardship Program as part of the Agency's management and research responsibilities in the Pribilof Islands. The Program was founded in 1993 through the Challenge Grant Program of the U.S. Fish and Wildlife Service (FWS). Through the FWS program, the NMFS, Pribilof Islands School District and local entities from St. Paul and St. George Islands serve as sponsors and provide a variety of funding and in-kind support. The Program focuses on involving the youth and young adults of the Pribilof Islands in management and research efforts to develop and establish a stewardship ethic regarding the unique wildlife and habitat of the islands by combining traditional knowledge and cultural practices with modern science and management methods.

The NMFS Alaska Region provides office and other material support and agency resource managers, and research scientists serve as mentors and advisors to those in the program by directly involving them in on the job training and experience with a variety of projects. The Program expands NMFS' outreach capacity by providing a local point of contact and interaction with tourists, the fishing industry, and the local residents regarding marine mammal and habitat issues in the Pribilof Islands through regular orientation presentations, media publicity and involvement in community events and functions. The Program has been very successful and is expected to progress in 1998.

Other Outreach Efforts

Other public education/outreach efforts by the Alaska Region involve marine mammal strandings. The main issue of concern in coastal Alaska is during harbor seal pupping season when the public attempts to "rescue" apparently abandoned pups. The region has published information for distribution to newspaper and other media sources reiterating the need to leave the pups undisturbed.

Chapter XII. International Programs and Activities

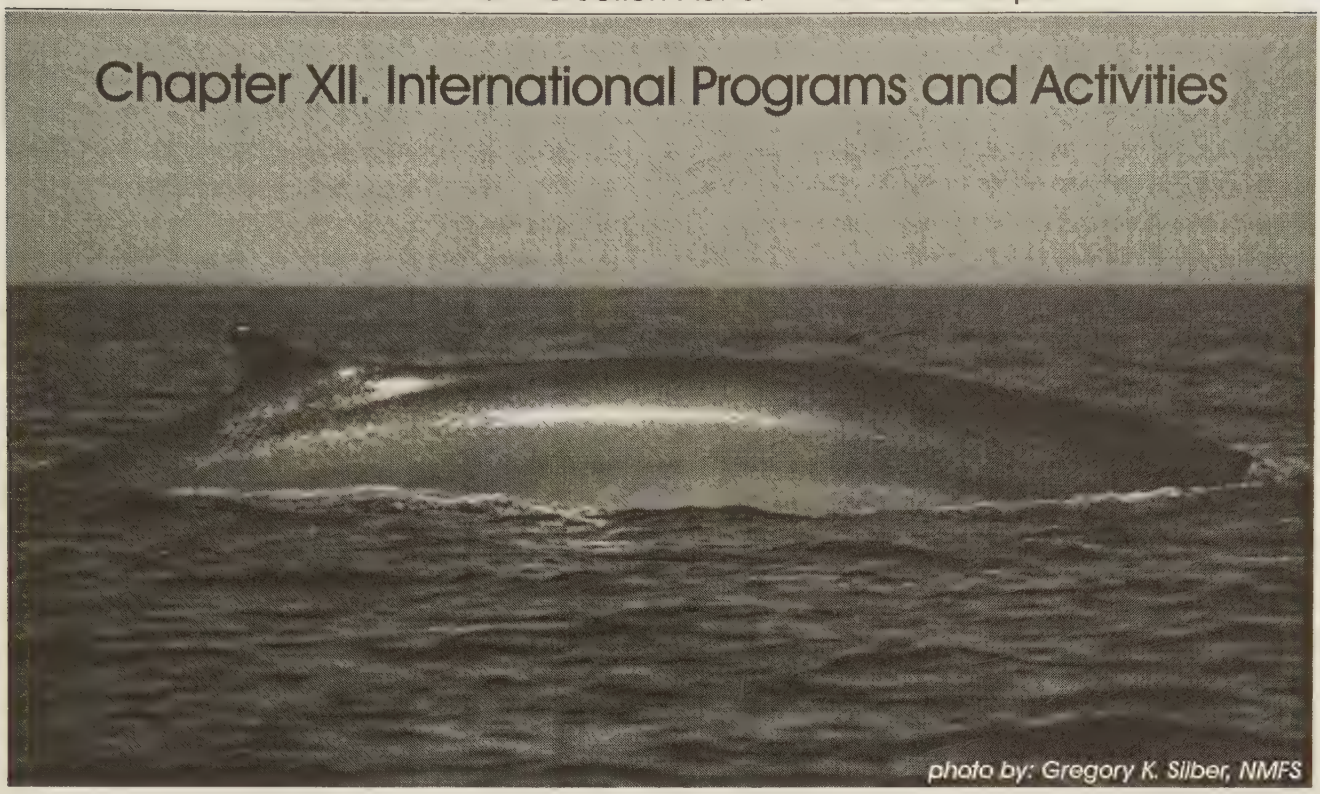


photo by: Gregory K. Silber, NMFS

Under section 108(1) of the Marine Mammal Protection Act (MMPA), the Secretary of Commerce is mandated to :

"...initiate negotiations as soon as possible for the development of bilateral or multinational agreements with other nations for the protection and conservation of all marine mammals covered by this Act."

As a result, the Departments of Commerce, the Interior, and State, in consultation with the Marine Mammal Commission, must pursue international agreements, and, when necessary, negotiate new agreements, to achieve the purposes of the MMPA. This chapter describes NMFS involvement in international programs and activities pertaining to marine mammals during 1997.

International Whaling Commission

The International Convention for the Regulation of Whaling (ICRW) was established in 1946 with the objective of achieving proper conservation of world whale stocks, thus making possible the orderly development of the whaling industry. The Convention created the International Whaling Commission (IWC) to provide for a continuing review of the condition of whale stocks and for such additions to or modifications of the agreed conservation measures as might appear desirable. In the United States, the treaty is implemented through the Whaling Convention Act of 1949.

Past actions by the IWC include the establishment of a whale sanctuary in the Indian Ocean area and in the Southern Ocean (in most of the waters south of 40°S lat.), prohibition on the use of cold grenade (non-exploding) harpoons to kill whales for commercial purposes, a moratorium on all commercial whaling from the beginning of the 1985-86 pelagic and 1986 coastal seasons, and the adoption of a separate and distinct management scheme for aboriginal subsistence whaling.

Commercial and Scientific Whaling

The IWC continues to maintain the moratorium on commercial whaling. However, Norway lodged a timely objection to the 1982 moratorium decision, and therefore is not bound by that decision. Thus, it continues to take minke whales from the Northeast Atlantic Ocean.

The Government of Norway set its 1998 quota at 671 minke whales *(Balaenoptera acutorostrata)*. In 1997, 503 minke whales were killed. The 1998 quota will include a carryover of 50 whales per the Scientific Committee's recommendation that a carryover provision be allowed as part of the Revised Management Procedure.

Article VIII of the ICRW grants countries the right to issue permits to kill whales for scientific purposes. Annually, Japan takes about 540 minke whales from the North Pacific and Antarctic Oceans for scientific research. During the 1997/1998 season, Japan took 438 minke whales within the Southern Ocean Sanctuary and 100 minke whales in the North Pacific under its special permits for scientific whaling.

Aboriginal Subsistence Whaling

Aboriginal subsistence whaling, in accordance with limitations set by the IWC, is conducted by aboriginal Natives in Greenland, Russia, St. Vincent and the Grenadines, and the United States. In addition, although not currently an IWC member, Canada has continued to authorize the taking of bowhead whales by its Natives.

In 1996, the United States certified Canada under the Pelly Amendment for whaling outside the IWC provisions. The Pelly Amendment to the Fishermen's Protective Act of 1967 (22 U.S.C. 1978) requires the Secretary of Commerce to monitor the activities of foreign fishermen and certify when nationals of a foreign country are found, directly or indirectly, conducting fishing operations that diminish the effectiveness of an international fishery conservation program to which the United States is a party. The Secretary of Commerce has certified, under Pelly, several countries, including Norway, Russia, Japan and Canada, for whaling activities.

The 1997 Annual Meeting

The 49th annual IWC meeting was held in Monaco from October 20-24, 1997, and was preceded by 12 days of meetings of the IWC Scientific Committee (in Bournemouth, England) and three days of working group and technical meetings.

At the annual meeting in Monaco, the IWC approved, by consensus, a five-year block (1998-2002) quota of 620 gray whales with an annual cap of 140 animals. The quota was based on a joint proposal by the United States and the Russian Federation and will be shared by the Makah tribe and the Chukotka Natives of the Russian Federation. The IWC also approved a five-year block quota for 280 landed bowhead whales, again based on a joint proposal by the United States and the Russian Federation.

A proposal by Ireland to establish a global whale sanctuary with limited commercial exceptions was discussed both in the meeting and in informal gatherings, without any concrete progress. Japan's bid for an interim relief quota of 50 minke whales for its small-type coastal whalers was again denied based on its commercial elements. Resolutions were passed condemning Norway's whaling and urging Japan to refrain from issuing permits for scientific takes in the Antarctic and north Pacific oceans.

U.S. - Russia Marine Mammal Project

The Marine Mammal Project is one of eight projects in Area V of the US-Russia Agreement on Cooperation in the Field of the Environment and Natural Resources. The goal of the Project is to conduct cooperative research on the biology, ecology, and population dynamics of marine mammal species shared by both countries, leading to the development of methods for the rational management and protection of these animals. This agreement was signed by U.S. Vice President Al Gore and Russian Prime Minister Viktor Chernomyrdin on June 23, 1994, and supersedes the Agreement between the United States of America and the Union of Soviet Socialists Republics on Cooperation in the Field of Environmental Protection of May 23, 1972.

The Marine Mammal Working Group established under the Agreement met April 7-11, 1997, in Kahuku, Hawaii, to develop the protocol of the 14th meeting. The Working Group reviewed activities conducted during the past two years, finalized plans for joint activities, and offered invitations for Russian and U.S. scientists to participate in joint research projects for 1998 and 1999. The protocol was finalized and approved during the Area

V meetings between Russia and the United States in Moscow, December 14-16, 1997. Joint activities during 1996 and 1997 were discussed at the April meeting and included: joint studies on bowhead whales *(Balaena mysticetus)* in the southern Shantar Archipelago, photographic cataloguing of individually identified whales to be used to estimate abundance, observations of the general behavior and habitat use by these whales, about 25 biopsy samples for genetic work, as well as analyses by the NMFS Southwest Fisheries Science Center to compare Okhotsk Sea bowheads with bowhead whales harvested off Barrow, Alaska.

Joint research in the future will continue to focus on both gray *(Eschrichtius robustus)* and bowhead whales. The western North Pacific population of gray whales is recognized as one of the world's most endangered populations of baleen whale. Research during summer 1997 included gathering data on occurrence patterns, numbers, habitat use, and potential human effects. These types of studies have all been used successfully for California gray whales and for bowhead whales in Alaska and Canada. This expanded collaborative work is being conducted in response to the joint statement issued at the February 1997 Gore-Chernomyrdin Commission "On Measures to Ensure Conservation of Biological Diversity near Sakhalin Island."

The Working Group also discussed recent US-Russian meetings regarding the creation of a new subgroup conditionally named, "Conservation and Management of Cetacean Populations Utilized in Aboriginal Whaling." This subgroup would review research and appropriate management measures in accordance with IWC regulations on gray and bowhead whales taken by the Native people of Chukotka and Alaska. However, the Working Group noted that the question of the subgroup's specific tasks, authority, status, and structure requires further detailed development and agreement. Membership within this new subgroup will be determined by the U.S. and Russian IWC Commissioners, and activities resulting from this new subgroup will be reported back to the Working Group. Working Group members encouraged the creation of this new subgroup.

Results were presented of Russian research concerning the redistribution of Steller sea lions *(Eumetopias jubatus)* on rookery sites, which may reflect altered age-sex composition of the population at rookeries, were presented to the Working Group. Pup surveys conducted in recent years at the main rookery sites of the Kuril Islands suggest that the population declines have ended.

The Russians addressed the work conducted by KamchatRybVod and other Russian institutes in 1995 and 1996. In both years monitoring work was conducted on Medniy Island and Cape Kozlov; two vessel surveys were conducted in the Kuril Islands; 1,100 newly born pups were tagged; and information was gathered on 2,800 returns of sea lions previously tagged. The abundance of sea lions on Medniy Island and at the rookery by Cape Kozlov remains fairly constant, while the abundance of newborn pups on Medniy Island gradually is increasing.

The United States reported results of federal and state-conducted Steller sea lion research in Alaska. A 1996 census of adults showed a continued overall decline of 7.8% since 1994 surveys, similar in magnitude to results observed between 1992 and 1994. Numbers have also decreased in Southeast Alaska by 7.2%; past surveys indicated that this area was stable or increasing. Future surveys will determine if the detected decline there is due merely to a variation in haul out patterns or if the decline in Southeast Alaska is real. Counts of pups throughout most of Alaska also showed an overall decline of 6.1% (see Chapter VII. Conservation and Recovery Programs).

The United States reported results of northern fur seal *(Callorhinus ursinus)* research conducted by the National Marine Mammal Laboratory (NMML) and its collaborators during 1995 and 1996. In 1996, approximately 170,000 pups were born on St. Paul Island, which was not significantly different from the 1990, 1992, or 1994 censuses. On St. George Island, over 27,000 pups were estimated to have been born in 1996, which is a significant increase over 1992 and 1994. This is the highest estimate since 1985 and may indicate an end to the population decline on St. George Island. The smaller populations of fur seals on Bogoslof Island, Alaska and San Miguel Island, Calfornia, have continued to increase. Long-term trends in the number of adult males counted

and in rates of entanglement in marine debris were presented. Additionally, genetic studies to identify both U.S. and Russian fur seal stocks and their interrelationships are being conducted.

Russian research on fur seals of the Commander Islands included a census showing a slight reduction in pup production on the Commander Islands overall. In 1995-96, efforts were taken to monitor feeding ecology and behavior of female fur seals. Histological samples of reproductive organs were collected from females who died during the breeding period. Tagging animals was conducted to analyze the age structure of the population. Other research focused on the dependence of fur seal survival on their weight, length, and date of birth. Together with NMML specialists in Seattle, data on the growth of fur seal pups were analyzed, and an article was prepared for publication. Work is planned for 1998 on maternal investment of fur seal females, and American colleagues will be invited to participate.

The United States reported on the results of harbor seal *(Phoca vitulina)* census surveys by NMFS from 1991 to 1996. Because of Alaska's large size, the state is divided into four sections, and one section is surveyed each year. One four-year cycle has already been completed, and the second cycle is half completed. The current uncorrected estimate of the number of harbor seals in Alaska is 49,213. Studies were completed to estimate the number of seals missed during aerial surveys, because the seals were in the water and not hauled out when the aerial surveys were performed. These correction factors are being developed for each type of haulout substrate (rocky, sand bar, ice) and in each stock area. In 1994, a correction factor of 1.74 was calculated for rocky substrate in Southeast Alaska. In 1995 and 1996 a correction factor of 1.50 was calculated for sand bar haulouts in Prince William Sound (under ideal conditions), and under very poor conditions (high winds and rains), the correction factor was 2.50.

The Russian participants informed the Working Group of a study conducted by the Pacific Institute of Fisheries and Oceanographic Research (TINRO) Marine Mammal Laboratory on the abundance of largha seals *(Phoca largha)* in Peter the Great Bay. It conducted studies by making a comparison of total seal abundance. Figures from the 1960s and recent data from 1995-1996 suggest that largha seal abundance has declined. The suspected reason for this decline of adult seals is incidental taking in fishing nets which account for an annual mortality of 100-150 animals. Fifteen coastal rookeries have been noted, mainly on islands to the southwest, extending to the border with Korea. Pups haul out on shore, though there are cases where pups haul out on ice.

In September 1997, a scientist from the Russian Academy of Sciences in Petropavlovsk-Kamchatski visited scientists at the Alaska Department of Fish and Game, Fairbanks, for one month to analyze largha seal telemetry data. In addition, a Russian scientist from TINRO-Magadan visted with scientists from NMML in August to participate in harbor seal research in Southeast Alaska.

Convention on International Trade in Endangered Species of Wild Fauna and Flora

The 10th Meeting of the Conference of the Parties (COP10) to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was held July 6-20, 1997 in Harare, Zimbabwe. Following is a brief description of agenda items and outcomes. All votes required a 2/3 majority of those voting for passage. In a departure from previous CITES meetings, secret ballots were individually requested for each vote described below.

Resolution with the IWC

Resolution on the relationship between CITES and the IWC Japan proposed to repeal CITES Resolution Conf. 2.9, in which CITES recommends that parties agree not to issue any import or export permit for any species protected from commercial whaling by the International Whaling Commission (IWC). The United States opposed the Japanese proposal, on the grounds that the IWC has never withdrawn its request for support from CITES members in enforcing the commercial moratorium on whaling. Japan called for a secret ballot. The proposal, which required a 2/3 vote to pass, was defeated with 27 votes in favor, 51 against.

Illegal Trade in Whale Meat

In 1994, the CITES Parties passed a resolution to address illegal international trade in whale meat, which presisted despite the listing of these species in Appendix I of the treaty. A species is listed in Appendix I when it considered to be threatened with extinction under specific CITES criteria. The resolution recognizes the work of the IWC on the issue and urges CITES Parties to investigate illegal trade in whale meat and cooperate with the CITES Secretariat in the collection of this information. It also encourages the sharing of information between the IWC and CITES on illegal trade and directs the Secretariat to share with the IWC any information it collects regarding illegal trade in whale meat. Since 1994, NMFS has met on several occasions with Japanese government officials to facilitate exchange of information about ways to stop illegal trade in whales. This topic was included on the agenda for COP10, and a working group was convened. A Decision of the Parties was adopted that calls for increased enforcement cooperation, particularly in DNA testing of whale meat collected.

The next CITES Conference of Parties will be held in 2000.

Species Proposed for CITES Downlisting

Several species of whales were proposed for downlisting to Appendix II of CITES by Japan. The following are outcomes in voting for populations/stocks of these species:

Gray whale *(Eschrichtius robustus)* lost: 47 yes-61 no-8 abstentions

Okhotsk Sea minke whale *(Balaenoptera acutorostrata)* lost: 45 yes-65 no-7 abstentions

Southern hemisphere minke whale - lost: 53 yes-59 no-4 abstentions

Bryde's whale *(Balaenoptera edeni)* withdrawn by proponent

Several species of whales were proposed for downlisting to Appendix II by Norway. The following is the outcome in voting for population/stock of these species:

North Atlantic minke whale *(Balaenoptera acutorostrata)* lost: 57 yes-51 no-6 abstentions

Appendices

Appendix A. Summary of 1996 Marine Mammal Stock Assessments for Stocks Under NMFS Authority

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish. Mort.	Strategic Status
Steller sea lion	Western U.S.	AKA	AKC	42,536	0.12	0.15	383	447	35	Y
Steller sea lion	Eastern	AKA	AKC	37,166	0.12	0.75	1,672	17	2	Y
Northern fur seal	North Pacific	AKA	AKC	969,595	0.086	0.5	20,846	1,731	18	Y
Harbor seal	Southeast Alaska	AKA	AKC	35,226	0.12	1.0	2,114	1,704	36	N
Harbor seal	Gulf of Alaska	AKA	AKC	22,427	0.12	0.5	673	886	36	N
Harbor seal	Bering Sea	AKA	AKC	12,648	0.12	0.5	379	209	31	N
Spotted seal	Alaska	AKA	AKC	N/A[1]	0.12	0.5	N/A	N/A	2	N
Bearded seal	Alaska	AKA	AKC	N/A	0.12	0.5	N/A	N/A	2	N
Ringed seal	Alaska	AKA	AKC	N/A	0.12	0.5	N/A	N/A	1	N
Ribbon seal	Alaska	AKA	AKC	N/A	0.12	0.5	N/A	N/A	1	N
Beluga	Beaufort Sea	AKA	AKC	32,453	0.04	1.0	649	160	0	N
Beluga	Eastern Chukchi Sea	AKA	AKC	3,710	0.04	1.0	74	54	0	N
Beluga	Eastern Bering Sea	AKA	AKC	6,439	0.04	1.0	129	127	0	N
Beluga	Bristol Bay	AKA	AKC	1,316	0.04	1.0	26	20	1	N
Beluga	Cook Inlet	AKA	AKC	752	0.04	1.0	15	40	0	Y
Killer whale	Eastern North Pacific, Northern Resident	AKA	AKC	764	0.04	0.5	7.6	1.4	1.4	N
Killer whale	Eastern North Pacific, Transient	AKA	AKC	314	0.04	0.5	3.1	1.4	1.4	N
Pacific white-sided dolphin	North Pacific	AKA	AKC	486,719	0.04	0.5	4,867	4	4	N
Harbor porpoise	Southeast Alaska	AKA	AKC	8,156	0.04	0.5	82	4	4	N
Harbor porpoise	Gulf of Alaska	AKA	AKC	7,085	0.04	0.5	71	25	25	N
Harbor porpoise	Bering Sea	AKA	AKC	8,549	0.04	0.5	86	2	2	N

Appendix A. (cont.) Summary of 1996 Marine Mammal Stock Assessments for Stocks Under NMFS Authority

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish. Mort.	Strategic Status
Dall's porpoise	Alaska	AKA	AKC	76,874	0.04	1.0	1,537	42	42	N
Sperm whale	Alaska	AKA	AKC	N/A	0.04	0.1	N/A	0.0	0.0	Y
Baird's beaked whale	Alaska	AKA	AKC	N/A	0.04	0.5	N/A	0.0	0.0	N
Cuvier's beaked whale	Alaska	AKA	AKC	N/A	0.04	0.5	N/A	0.0	0.0	N
Stejnerger's beaked whale	Alaska	AKA	AKC	N/A	0.04	0.5	N/A	0.0	0.0	N
Gray whale	Eastern North Pacific	AKA	AKC	21,597	0.04	1.0	432	47	4	N
Humpback whale	Western North Pacific	AKA	AKC	N/A	0.04	0.1	N/A	0.0	0.0	Y
Humpback whale	Central North Pacific	AKA	AKC	1,407	0.04	0.1	2.8	0.80	0.80	Y
Fin whale	N. Pacific	AKA	AKC	N/A	0.04	0.1	N/A	0.0	0.0	Y
Minke whale	Alaska	AKA	AKC	N/A	0.04	0.5	N/A	0.0	0.0	N
Northern right whale	North Pacific	AKA	AKC	N/A	0.04	0.1	N/A	0.0	0.0	Y
Bowhead whale	Western Arctic	AKA	AKC	7,738	0.04	0.5	77[1]	51	0.0	Y
Harbor seal	Western North Atlantic	ATL	NEC	28,810	0.12	1.0	1,729	476	476	N
Gray seal	Northwest North Atlantic	ATL	NEC	2,035	0.12	1.0	122	4.5	4.5	N
Harp seal	Northwest North Atlantic	ATL	NEC	N/A	N/A	N/A	N/A	0.0	0.0	N
Hooded seal	Northwest North Atlantic	ATL	NEC	N/A	N/A	N/A	N/A	0.0	0.0	N
Harbor porpoise	Gulf of Maine/Bay of Fundy	ATL	NEC	48,289	0.04	0.5	483	1,834	1,834	Y
Risso's dolphin	Western North Atlantic	ATL	NEC	11,140	0.04	0.5	111	68	68	N
Atlantic white-sided dolphin	Western North Atlantic	ATL	NEC	19,196	0.04	0.5	192	181	181	N
White-beaked dolphin	Western North Atlantic	ATL	NEC	N/A	0.04	N/A	N/A	0.0	0.0	N
Common dolphin	Western North Atlantic	ATL	NEC	3,996	0.04	0.5	40	234	234	Y
Atlantic spotted dolphin	Western North Atlantic	ATL	NEC	1,617[3]	0.04	0.5	16	22[3]	22[3]	Y
Pantropical spotted dolphin	Western North Atlantic	ATL	NEC	1,617[3]	0.04	0.5	16	22[2]	22[3]	Y

Appendix A (cont). Summary of 1996 Marine Mammal Stock Assessments for Stocks Under NMFS Authority

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Total Fish Mort.	Strategic Status
Striped dolphin	Western North Atlantic	ATL	NEC	18,220	0.04	0.45	164	47	47	N
Spinner dolphin	Western North Atlantic	ATL	NEC	N/A	N/A	N/A	N/A	1.0	1.0	N
Bottlenose dolphin	Western North Atlantic, offshore	ATL	NEC	8,794[1]	0.04	0.5	88	82	82	N
Bottlenose dolphin	Western North Atlantic, coastal	ATL	SEC	2,482	0.04	0.5	25	29	29	Y
Dwarf sperm whale	Western North Atlantic	ATL	NEC	N/A	0.04	N/A	N/A	0.2	0.2	Y
Pygmy sperm whale	Western North Atlantic	ATL	NEC	N/A	0.04	N/A	N/A	N/A	N/A	Y
Killer whale	Western North Atlantic	ATL	NEC	N/A	0.04	N/A	N/A	0.0	0.0	N
Pygmy killer whale	Western North Atlantic	ATL	SEC	6	0.04	0.5	0.1	0.0	0.0	N
Northern bottlenose whale	Western North Atlantic	ATL	NEC	N/A	0.04	N/A	N/A	0.0	0.0	N
Cuvier's beaked whale	Western North Atlantic	ATL	NEC	895[2]	0.04	0.5	8.9	9.7	9.7[3]	Y
Mesoplodont beaked whale	Western North Atlantic	ATL	NEC	895[5]	0.04	0.5	8.9	9.7	9.7[6]	Y
Pilot whale, long-finned (Globicephala spp.)	Western North Atlantic	ATL	NEC	4,968[4]	0.04	0.5	50	42	42[6]	N[6]
Pilot whale, short-finned	Western North Atlantic	ATL	NEC	457	0.04	0.5	3.7	42	42[8]	Y
Sperm whale	Western North Atlantic	ATL	NEC	1,617	0.04	0.1	3.2	0.2	0.2	N
North Atlantic right whale	Western North Atlantic	ATL	NEC	295	0.025	0.1	0.4	2.5	1.1[7]	Y
Humpback whale	Western North Atlantic	ATL	NEC	4,848	0.04	0.1	9.7	5.5	4.1[8]	Y
Fin whale	Western North Atlantic	ATL	NEC	1,704	0.04	0.1	3.4	0.0	0.0	Y
Sei whale	Western North Atlantic	ATL	NEC	N/A	0.04	0.1	N/A	0.0	0.0	Y
Minke whale	Canadian east coast	ATL	NEC	2,053	0.04	0.5	21	2.5	2.5	N
Blue whale	Western North Atlantic	ATL	NEC	N/A	0.04	0.1	N/A	0.0	0.0	Y

Appendix A (cont). Summary of 1996 Marine Mammal Stock Assessments for Stocks Under NMFS Authority

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish Mort.	Strategic Status
Bottlenose dolphin	Gulf of Mexico, outer continental shelf	ATL	SEC	43,233	0.04	0.5	432	2.8	2.8[1]	N
Bottlenose dolphin	Gulf of Mexico, continental shelf edge and slope	ATL	SEC	4,530	0.04	0.5	45	2.8	2.8[12]	N
Bottlenose dolphin	Western Gulf of Mexico coastal	ATL	SEC	2,938	0.04	0.5	29	13	13[2,3]	N
Bottlenose dolphin	Northern Gulf of Mexico coastal	ATL	SEC	3,518	0.04	0.5	35	10	10[14]	N
Bottlenose dolphin	Eastern Gulf of Mexico coastal	ATL	SEC	8,963	0.04	0.5	90	8	8[14]	N
Bottlenose dolphin	Gulf of Mexico bay, sound, and estuarine[4]	ATL	SEC	3,933	0.04	0.5	39.7	30	30[14]	Y
Atlantic spotted dolphin	Northern Gulf of Mexico	ATL	SEC	2,255	0.04	0.5	23	1.5[3]	1.5[3]	N
Pantropical spotted dolphin	Northern Gulf of Mexico	ATL	SEC	26,510	0.04	0.5	265	1.5[3]	1.5[3]	N
Striped dolphin	Northern Gulf of Mexico	ATL	SEC	3,409	0.04	0.5	34	0.0	0.0	N
Spinner dolphin	Northern Gulf of Mexico	ATL	SEC	4,465	0.04	0.5	45	0.0	0.0	N
Rough-toothed dolphin	Northern Gulf of Mexico	ATL	SEC	660	0.04	0.5	6.6	0.0	0.0	N
Clymene dolphin	Northern Gulf of Mexico	ATL	SEC	4,120	0.04	0.5	41	0.0	0.0	N
Fraser's dolphin	Northern Gulf of Mexico	ATL	SEC	66	0.04	0.5	0.7	0.0	0.0	N
Killer whale	Northern Gulf of Mexico	ATL	SEC	197	0.04	0.5	2.0	0.0	0.0	N
False killer whale	Northern Gulf of Mexico	ATL	SEC	236	0.04	0.5	2.4	0.0	0.0	N
Pygmy killer whale	Northern Gulf of Mexico	ATL	NEC	285	0.04	0.05	2.8	0.0	0.0	N
Dwarf sperm whale	Northern Gulf of Mexico	ATL	SEC	N/A	0.04	*N/A	N/A	0.0	0.0	Y

Appendix A (cont). Summary of 1996 Marine Mammal Stock Assessments for Stocks Under NMFS Authority

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish Mort.	Strategic Status
Pygmy sperm whale	Northern Gulf of Mexico	ATL	SEC	N/A	0.04	N/A	N/A	0.0	0.0	Y
Melon-headed whale	Northern Gulf of Mexico	ATL	SEC	2,888	0.04	0.5	29	0.0	0.0	N
Risso's dolphin	Northern Gulf of Mexico	ATL	SEC	2,199	0.04	0.5	22	19	19	N
Cuvier's beaked whale	Northern Gulf of Mexico	ATL	SEC	20	0.04	0.5	0.2	0.0	0.0	N
Blainville's beaked whale	Northern Gulf of Mexico	ATL	SEC	N/A	N/A	N/A	N/A	0.0	0.0	N
Gervais' beaked whale	Northern Gulf of Mexico	ATL	SEC	N/A	N/A	N/A	N/A	0.0	0.0	N
Pilot whale, short-finned	Northern Gulf of Mexico	ATL	SEC	186	0.04	0.5	1.9	0.3	0.3	Y
Sperm whale	Northern Gulf of Mexico	ATL	SEC	411	0.04	0.1	0.8	0.0	0.0	Y
Bryde's whale	Northern Gulf of Mexico	ATL	SEC	17	0.04	0.5	0.2	0.0	0.0	N
California sea lion	U.S.	PAC	SWC	111,339	0.12	1.0	6,680	974	915	N
Guadalupe fur seal	Mexico to California	PAC	SWC	3,028	0.137	0.5	104	0.0	0.0	Y
Northern fur seal	San Miguel Island	PAC	AKC	5,018	0.086	1.0	216	0.00	0.00	N
Harbor seal	California	PAC	SWC	27,962	0.12	1.0	1,678	243	234	N
Harbor seal	Oregon/ Washington coast	PAC	AKC	25,665	0.12	1.0	1,540	15	15	N
Harbor seal	Washington inland waters	PAC	AKC	15,349	0.12	1.0	921	36	36	N
Northern elephant seal	California breeding	PAC	SWC	51,625	0.083	1.0	2,142	145	145	N
Hawaiian monk seal	Hawaii	PAC	SWC	1,366	0.07	0.1	4.8[1]	N/A	N/A	Y
Harbor porpoise	Central California	PAC	SWC	3,431	0.04	0.48	33	14	14	N
Harbor porpoise	Northern California	PAC	SWC	7,640	0.04	0.5	76	0.0	0.0	N
Harbor porpoise	Oregon/ Washington coast	PAC	AKC	22,046	0.04	0.5	212	13	13	N
Harbor porpoise	Inland Washington	PAC	AKC	2,681	0.04	0.4	21	15	15	N

Appendix A (cont). Summary of 1996 Marine Mammal Stock Assessments for Stocks Under NMFS Authority

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish. Mort.	Strategic Status
Dall's porpoise	California /Oregon/ Washington	PAC	SWC	34,393	0.04	0.48	330	22	22	N
Pacific white-sided dolphin	California/ Oregon/ Washington	PAC	SWC	82,939	0.04	0.48	796	22	22	N
Risso's dolphin	California/ Oregon/ Washington	PAC	SWC	22,388	0.04	0.5	224	37	37	N
Bottlenose dolphin	California coastal	PAC	SWC	134	0.04	0.5	1.3	0.0	0.0	N
Bottlenose dolphin	California/ Oregon/ Washington offshore	PAC	SWC	1,904	0.04	0.5	15	4.4	4.4	N
Striped dolphin	California/ Oregon/ Washington	PAC	SWC	19,248	0.04	0.4	154	1.20	1.20	N
Common dolphin, short-beaked	California/ Oregon/ Washington	PAC	SWC	309,717	0.04	0.5	3,097	272	272	N
Common dolphin, long-beaked	California	PAC	SWC	5,504	0.04	0.48	53	14	14	N
Northern right whale dolphin	California/ Oregon/ Washington	PAC	SWC	15,080	0.04	0.5	151	47	47	N
Killer whale	Southern Resident Stock	PAC	AKC	96	0.04	1.0	1.9	0.00	0.00	N
Killer whale	California/ Oregon/ Washington	PAC	SWC	436	0.04	0.4	3.5	1.2	1.2	N
Pilot whale, short-finned	California/ Oregon/ Washington	PAC	SWC	741	0.04	0.48	5.9	13	13	Y
Baird's beaked whale	California/ Oregon/ Washington	PAC	SWC	252	0.04	0.4	2.0	1.2	1.2	N
Mesoplodont beaked whales	California/ Oregon/ Washington	PAC	SWC	1,169[1]	0.04	0.48	11[2]	9.2-13	9.2-13	Y
Cuvier's beaked whale	California/ Oregon/ Washington	PAC	SWC	6,070	0.04	0.5	61	28	28	N

Appendix A (cont). Summary of 1996 Marine Mammal Stock Assessments for Stocks Under NMFS Authority

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish Mort.	Strategic Status
Pygmy sperm whale	California/ Oregon/ Washington	PAC	SWC	2,059	0.04	0.45	19	2.8	2.8	N
Dwarf sperm whale	California/ Oregon/ Washington	PAC	SWC	N/A	0.04	0.5	N/A	0.0	0.0	N
Sperm whale	California to Washington	PAC	SWC	896	0.04	0.1	1.8	4.5	4.5	Y
Humpback whale	California/ Mexico	PAC	SWC	563	0.04	0.1	0.5	1.8	1.2	Y
Blue whale	California/ Mexico	PAC	SWC	1,463	0.04	0.1	1.5	0.2	0.0	Y
Fin whale	California to Washington	PAC	SWC	747	0.04	0.1	1.5	<1	0.0	Y
Bryde's whale	Eastern Tropical Pacific	PAC	SWC	11,163	0.04	0.5	0.2[1]	0.0	0.0	N
Sei whale	Eastern North Pacific	PAC	SWC	N/A	0.04	0.1	N/A	N/A	0.0	Y
Minke whale	California/ Oregon/ Washington	PAC	SWC	122	0.04	0.4	1.0	1.2	1.2	Y
Rough-Toothed dolphin	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Risso's dolphin	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Bottlenose dolphin	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Pantropical spotted dolphin	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Spinner dolphin	Hawaii	PAC	SWC	677	0.04	0.5	6.8	N/A	N/A	N
Striped dolphin	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Melon-headed whale	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Pygmy killer whale	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
False killer whale	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Killer whale	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Pilot whale, short-finned	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Blainville's beaked whale	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N

Appendix A (cont.). Summary of 1996 Marine Mammal Stock Assessments for Stocks Under NMFS Authority

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish. Mort.	Strategic Status
Cuvier's beaked whale	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Pygmy sperm whale	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Dwarf sperm whale	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N
Sperm whale	Hawaii	PAC	SWC	N/A	0.04	0.1	N/A	N/A	N/A	Y
Blue whale	Hawaii	PAC	SWC	N/A	0.04	0.1	N/A	N/A	N/A	Y
Fin whale	Hawaii	PAC	SWC	N/A	0.04	0.1	N/A	N/A	N/A	Y
Bryde's whale	Hawaii	PAC	SWC	N/A	0.04	0.5	N/A	N/A	N/A	N

1. N/A means that an estimate for the affected value is not available.
2. The IWC subsistence quota is not affected by the calculation of PBR using the formula specified in the MMPA.
3. This value includes either or both of *Stenella frontalis* or *Stenella attenuata*.
4. Estimates may include sightings of the coastal form.
5. This estimate includes Cuvier's beaked whales *(Ziphius cavirostris)* and mesoplodont beaked whales.
6. This is the average mortality of beaked whales *(Mesoplodon* sp.) based on five years of observer data. This annual mortality rate includes an unknown number of Cuvier's beaked whales.
7. This estimate includes both long-finned *(Globicephala macrorhynchus)* and short-finned pilot whales *(Globicephala melas)*.
8. Mortality data are not separated by species; therefore, species-specific estimates are not available. The mortality estimate represents both short- and long-finned pilot whales.
9. Mortality estimates for the 1994-1995 pelagic longline fishery are not available; status may be revised when these are available.
10. This is the average mortality of right whales *(Eubalaena glacialis)* based on five years of observer data (0.4) and additional fishery impact records (0.7).
11. This is the average mortality of humpback whales *(Megaptera novaeangliae)* based on five years of observer data (0.7) and additional fishery impact records (3.4).
12. This value may include either or both of the Gulf of Mexico, continental shelf edge and slope and the outer continental shelf stocks of bottlenose dolphins *(Tursiops truncatus)*.
13. Low levels of bottlenose dolphin mortality (0-4 per year) incidental to commercial fisheries have been reported It is unknown to which stock this mortality can be attributed.
14. Estimates derived from stranded animals with signs of fishery interactions, and these could be either coastal or estuary stocks.
15. This entry encompasses 33 stocks of bottlenose dolphins. All stocks are considered strategic; see the full report for information on individual stocks. The listed estimates for abundance, PBR and mortality are sums across all bays, sounds, and estuaries.
16. Although the calculated PBR is 5.0, the allowable take is zero due to findings under the ESA.
17. This value includes a species-specific minimum abundance estimate of 249 Blainville's beaked whales (*Mesoplodon densirostris)*.
18. This PBR includes 2.5 Blainville's beaked whales.
19. This PBR has been adjusted because only 0.2% of this stock is estimated to be in U.S. waters.

Appendix B. 1998 List of Category I and II Fisheries

Fishery Description	Estimated # of vessels/persons	Marine mammal species/stocks incidentally injured/killed	
Atlantic Ocean, Gulf of Mexico, and Caribbean Fisheries			
Category I			
Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics drift gillnet	15	North Atlantic right whale Sperm whale Pygmy sperm whale True's beaked whale Blainville's beaked whale Long-finned pilot whale White-sided dolphin Atlantic spotted dolphin Striped dolphin Bottlenose dolphin	Humpback whale Dwarf sperm whale Cuvier's beaked whale Gervais' beaked whale Risso's dolphin Short-finned pilot whale Common dolphin Pantropical spotted dolphin Spinner dolphin Harbor porpoise
Northeast multispecies sink gillnet (including species as defined in the Multispecies Fisheries Management Plan and spiny dogfish and monkfish)	341	North Atlantic right whale Spotted dolphin Minke whale White-sided dolphin Bottlenose dolphin Harbor seal Common dolphin Harp seal	Humpback whale False killer whale Killer whale Striped dolphin Harbor porpoise Gray seal Fin whale
Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline	361	Humpback whale Risso's dolphin Short-finned pilot whale Atlantic spotted dolphin Striped dolphin Harbor porpoise	Minke whale Long-finned pilot whale Common dolphin Pantropical spotted dolphin Bottlenose dolphin
Gulf of Maine, U.S. mid-Atlantic lobster trap/pot	13,000	North Atlantic right whale Fin whale White-sided dolphin	Humpback whale Minke whale Harbor seal
Category II			
U.S. mid-Atlantic coastal gillnet	>655	Humpback whale Bottlenose dolphin Harbor porpoise	Bottlenose dolphin Minke whale
Gulf of Maine small pelagics surface gillnet	133	Humpback whale Harbor seal	White-sided dolphin
Southeastern U.S. Atlantic shark gillnet	10	Bottlenose dolphin	North Atl. right whale
Atlantic squid, mackerel, butterfish trawl	620	Common dolphin Long-finned pilot whale White-sided dolphin	Risso's dolphin Short-finned pilot whale
North Carolina haul seine	25	Bottlenose dolphin	Harbor porpoise

Appendix B (cont). 1998 List of Category I and II Fisheries

Fishery Description	Estimated # of vessels/persons	Marine mammal species/stocks incidentally injured/killed	
Pacific Ocean Fisheries			
Category I:			
CA angel shark/halibut and other species large mesh (>3.5in) set gillnet	58	Harbor porpoise California sea lion Northern elephant seal	Common dolphin Harbor seal
CA/OR thresher shark/swordfish drift gillnet	130	Steller sea lion Dall's porpoise Risso's dolphin Common dolphin Short-finned pilot whale Mesoplodonts Pygmy sperm whale Harbor seal Harbor porpoise Minke whale	Sperm whale Pacific white-sided dolphin Bottlenose dolphin N. right whale dolphin Baird's beaked whale Cuvier's beaked whale California sea lion Northern elephant seal Humpback whale
Category II:			
AK Prince William Sound salmon drift gillnet	518	Steller sea lion Harbor seal Harbor porpoise	Northern fur seal Pacific white-sided dolphin Dall's porpoise
AK Peninsula/ Aleutians salmon drift gillnet	164	Northern fur seal Harbor porpoise Northern (Alaska) sea otter	Harbor seal Dall's porpoise
AK Peninsula/ Aleutian Island salmon set gillnet	109	Steller sea lion	Harbor porpoise
Southeast Alaska salmon drift gillnet	452	Steller sea lion Harbor porpoise Dall's porpoise	Harbor seal Humpback whale Pacific white-sided dolphin
AK Cook Inlet drift gillnet	577	Steller sea lion Harbor porpoise	Harbor seal Dall's porpoise
AK Cook Inlet salmon set gillnet	625	Steller sea lion Harbor porpoise	Harbor seal Beluga
AK Yakutat salmon set gillnet	147	Harbor seal	
AK Kodiak salmon set gillnet	173	Harbor seal	Harbor porpoise
AK Bristol Bay drift gillnet	1,882	Steller sea lion Harbor seal Gray whale Pacific white-sided dolphin	Northern fur seal Beluga Spotted seal
AK Bristol Bay set gillnet	967	Harbor seal Gray whale	Beluga Northern fur seal

Appendix B (cont). 1998 List of Category I and II Fisheries

Fishery Description	Estimated # of vessels/persons	Marine mammal species/stocks incidentally injured/killed	
AK Metlakatla/ Annette Island salmon drift gillnet	60	None documented	
WA Puget Sound Region salmon drift gillnet fishery (Treaty Indian fishing excluded)	900	Harbor porpoise Harbor seal	Dall's porpoise
CA anchovy, mackerel, tuna purse seine	150	Bottlenose dolphin Harbor seal	California sea lion
CA squid purse seine	65	Short-finned pilot whale	
AK Southeast salmon purse seine	373	Humpback whale	
AK pair trawl	2	None documented	
OR swordfish floating longline fishery	2	None documented	
OR blue shark floating	1	None documented	

Appendix C. Marine Mammal Authorization Program Mortality/Injury Reports for 1997

Species	Fisheries	Injured	Killed
Pilot whale	Atlantic squid/mackerel/butterfish trawl	1	0
	North Atlantic bottom trawl	0	1
Atlantic white-sided dolphin	Northeast multispecies sink gillnet	0	4
Pacific white-sided dolphin	CA/OR thresher shark/swordfish drift gillnet	0	3
Common dolphin	CA/OR thresher shark/swordfish drift gillnet	1	18
	Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics drift gillnet	0	4
Risso's dolphin	CA/OR thresher shark/swordfish drift gillnet	0	3
Spinner dolphin	Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics longline	1	0
Northern right whale dolphin	CA/OR thresher shark/swordfish drift gillnet	0	4
Harbor porpoise	CA/OR thresher shark/swordfish drift gillnet	0	2
	Northeast multispecies sink gillnet	0	30
	Mid-Atlantic coastal gillnet	0	4
Dall's porpoise	AK Southeast salmon drift gillnet	0	1
	WA/OR/CA groundfish trawl	0	1
Humpback whale	Mid-Atlantic purse seine	1	0
Unidentified small cetacean	CA/OR thresher shark/swordfish drift gillnet	0	2
	Atlantic Ocean/Caribbean/Gulf of Mexico large pelagics drift gillnet	0	1
	Northeast multispecies sink gillnet	0	1
California sea lion	CA/OR thresher shark/swordfish drift gillnet	3	17
	CA angel shark/halibut/other species large mesh set gillnet	0	4
	WA/OR salmon net pens	0	16
Steller sea lion	WA/OR/CA groundfish trawl	0	1
Harbor seal	Northeast multispecies sink gillnet*	0	42
	WA/OR salmon net pens	0	11
Northern elephant seal	CA/OR thresher shark/swordfish drift gillnet	0	6
Northern fur seal	WA/OR/CA groundfish trawl	0	2
Grey seal	Northeast multispecies sink gillnet	0	9
Unidentified seal	Northeast multispecies sink gillnet**	0	5
Sea otter	WA/OR/CA groundfish trawl	0	1

*This category also includes reports of 13 spotted seals, which are assumed to be harbor seals, since spotted seals are not typically found in the Atlantic Ocean.

**This category also includes a report of 1 ringed seal, which is not typically found in the Atlantic Ocean.

Appendix D. Estimates of Total Incidental Dolphin Mortality for U.S. and Foreign Purse Seine Vessels in the Eastern Tropical Pacific Ocean, 1971-1997

Year	U.S. Vessels[1]	U.S. Kill[2]	Foreign Vessels[1]	Foreign Kill[3]	Total Kill[4]
1971	124	246,213	48	15,715	261,928
1972	127	368,600	58	55,078	423,678
1973	133	206,697	68	58,276	264,973
1974	135	147,437	77	27,245	174,682
1975	142	166,645	82	27,812	194,457
1976	155	108,740	94	19,482	128,222
1977	142	25,452	104	25,901	51,353
1978	101	19,366	121	11,147	30,513
1979	93	17,938	121	3,488	21,426
1980	89	15,305	132	16,665	31,970
1981	94	7,890	118	7,199	35,089
1982	89	23,267	97	5,837	29,104
1983	60	8,513	99	4,980	13,493
1984	34	17,732	91	22,980	40,712
1985	36	19,205	105	39,642	58,847
1986	34	20,692	101	112,482	133,174
1987	34	13,992	126	85,195	99,187
1988	37	19,712	95	59,215	78,927
1989	29	12,643	93	84,336	96,979
1990	29	5,083	94	47,448	52,531
1991	13	1,004	90	26,288	27,292
1992	7	431	90	15,108	15,539
1993	7	115	89	3,486	3,601
1994	7	106	75	3,989	4,095
1995	5	0	99	3,274	3,274
1996	6	0	88	2,547	2,547
1997	6	0	92	3,000	3,000

[1]Data from Inter-American Tropical Tuna Commission (IATTC).
[2]Data from National Marine Fisheries Service (NMFS).
[3]Derived by subtracting U.S. data from IATTC total mortality estimates of sets made on dolphin during the period.
[4]Data for 1971-78 from NMFS; data after 1978 from IATTC using MPS method.

Appendix E. Cetacean Strandings in 1997

Species	1997				
	NE	SE	SW	NW	AK
Balaenidae					
Northern Right Whale		1			
Balaenopteridae					
Blue Whale					
Bryde's Whale					
Fin Whale	4	1	1	1	
Humpback Whale	1	4	6		7
Minke Whale	15	1			1
Sei Whale					
Eschrichtiidae					
Gray Whale			10	3	3
Unidentified Whale		1	8	1	2
Physeteridae					
Sperm Whale	1	2	4		1
Dwarf Sperm Whale		4			
Pygmy Sperm Whale	3	31			
Pyg. or Dwf. Sperm Whale		3			
Ziphiidae					
Baird's Beaked Whale					
Blainville's Beaked Whale		1	1		
Bottlenose Whale					
Cuvier's Beaked Whale		1	2		
Gervais' Beaked Whale	1	2			
Hubbs' Beaked Whale					
Stejneger's Beaked Whale					
Unidentified Beaked Whale		3			
Monodontidae					
Beluga					1
Delphinidae					
Killer Whale			1		2
False Killer Whale	1	1	1		
Pygmy Killer Whale		2			

Appendix E (cont).Cetacean Strandings in 1997

Species	1997				
	NE	SE	SW	NW	AK
Delphinidae (cont.)					
Long-finned Pilot Whale	4	1			
Short-finned Pilot Whale	1	1			
Atlantic White-sided Dolphin	17				
Pacific White-sided Dolphin			5		
Risso's Dolphin	4	3	2		
Rough-Toothed Dolphin		35			
White-Beaked Dolphin	2				
Long-snouted Spinner		1	3		
Short-snouted Spinner		1			
Atlantic spotted Dolphin		2			
Bottlenose Dolphin	74	490	6		
Spotted Dolphin		1			
Striped Dolphin	7	5	3	1	
Common Dolphin			15		
Unidentified Stenella sp.		7			
Unidentified Dolphin		3	17	1	
Phocoenidae					
Dall's Porpoise			4	10	2
Harbor Porpoise	82	25	26	3	4
Unidentified Cetacean	2		3		4
TOTAL CETACEAN	219	633	118	20	27

Appendix F. Pinniped Strandings in 1997

Species	1997				
	NE	SE	SW	NW	AK
Otariidae					
California Sea Lion			1262	10	
Steller Sea Lion			7	3	6
Guadalupe Fur Seal			2		
Northern Fur Seal			50	1	1
Phocidae					
Gray Seal	41	1			
Harbor Seal	150	1	297	127	17
Harp Seal	119				
Hooded Seal	40	1			
Northern Elephant Seal			241		3
Ringed Seal	1				1
Hawaiian Monk Seal			23		
Unidentified phocid					
Unidentified pinniped	1		202	113	3
TOTAL PINNIPED	352	3	2084	254	31
TOTAL MARINE MAMMALS (cetaceans and pinnipeds)	571	636	2202	274	58

Appendix G: NMFS Protected Resources Headquarters, Regional Offices and Fisheries Science Centers

NMFS Office of Protected Resources
1315 East-West Highway
Silver Spring, Maryland 20910
phone (301) 713-2322
fax (301) 713-0376

NMFS Northeast Region
One Blackburn Drive
Gloucester, MA 01930
phone (978) 281-9328
fax (978) 281-9394

NMFS Southeast Region
9721 Executive Center Drive
St. Petersburg, FL 33702-2432
phone (727)570-5312
fax (727) 570-5517

NMFS Northwest Region
7600 Sand Point Way NE
Seattle, WA 98115-0070
phone (206) 526-6150
fax (206) 526-6426

NMFS Southwest Region
501 West Ocean Blvd., Suite 4200
Long Beach, CA 90802-4213
phone (562) 980-4020
fax (562) 980-4027

NMFS Alaska Region
709 W. 9th St., Federal Building Rm. 461
P.O. Box 21668
Juneau, AK 99802
phone (907) 586-7235
fax (907) 586-7012

NMFS Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543
phone (508) 495-2361
fax (508) 495-2258

NMFS Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, FL 33149
phone (305) 361-4284
fax (305) 361-4219

NMFS Northwest Fisheries Science Center
2725 Montlake Blvd. E., West Bldg.
Seattle, WA 98112
phone (206) 860-3200
fax (206) 860-3217

NMFS Southwest Fisheries Science Center
8604 La Jolla Shores Drive
P.O. Box 271
La Jolla, California 92038-0271
phone (619) 546-7000
fax (619) 546-7003

NMFS Alaska Fisheries Science Center
7600 Sand Point Way NE, Bldg. 4
Seattle, WA 98115
phone (206) 526-4000
fax (206) 526-4004

DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA